Science Library 42 MAR 5 1947

ROCKS AND MINERALS

Official Journal of the Rocks and Minerals Association

Vol. 22, No. 2

Whole No. 187

A Magazine for Mineralogists, Geologists and Collectors

FEBRUARY, 1947

35c

9th LIST OF FINE MINERALS FROM AN OLD COLLECTION

Silver, Michigan. Remarkable, large xlline. mass. 7½ x 4½ x ¾". Partly bright. Weighing 43 ounces avdps. $40.00
Opal, Queensland. In ironstone. 3 x 1½. Good fire, blue and green. Plus 20% Federal tax. 15.00
Rutilated Quartz, Brazil. 3 x 2½ x 1. Polished curved face. Plus tax .. 7.50
Heulandite, Iceland. Xld. on drusy Quartz. 3 x 2½ x 1½ 2.00
Cacoxenite, Beartown, Pa. Xld. tufts on Limonite. 3 x 2½. Very good. 5.00
Hematite, Urals. Large loose complex xl. 2 x 1¾. 2.00
Cuprite, Bisbee. Good xld. mass w. Copper. 2 x 2½. 2.50
Datolite, Michigan. Enclosing Copper, polished. 3 x 2¼ x 1 ..... 5.00
Aurichalcite, Bisbee. Xld. in rock. 4 x 3 x 2. ..... 3.00
Bornite, Collahuasi, Chile. With some Chalcopyrite. 4 x 1¾ x 1½. 1.50
Colusite, Butte. Mass on Quartz. 1¾ x 1½. 1.50
Enargite, Butte. Group of large dull xls. 4 x 3½. 10.00
Hematite, Elba. Good xls. w. iridescent tarnish. 2½ x 1½. 2.00
Argentite, Butte. Xld. on Quartz w. Pyrite. 2 x 2. ..... 2.50
Freirinite, Chile. Veins w. Erythrite in rock. 2½ x 1½. 3.00
Tetrahedrite, Bolivia. Xld. and massive on Quartz. 4 x 2½ x 2. ..... 4.00
Niccolite, Ontario. Intimate mixture w. Smaltite. 3 x 2½ 2.50
Bellingerite, Chile. Micro. xld. and xlline. on rock. 2½ x 2½. 6.00
Riebeckite, Colorado. Crude xls. in rock. 3½ x 2½. 1.50
Garnet, Achmatovsk. Brilliant xls. w. Diopside & Clinochlore. 2½ x 3½. 10.00
Eosphorite, Maine. Minutely xld. in Albite. 2½ x 2. ..... 3.00
Antlerite, Chile. Pure xlline. fibrous mass. 3 x 2 x ¾. 6.00
Analcite, Arendal. Good glassy pinkish xls. on rock. 3½ x 2¼ 2.50
Bismuth, Cornwall. Xlline. masses in rock. 2½ x 2½. 3.00
Psilomelane, Vermont. Small botryoidal & stalactitic. 3 x 2 x 2. ..... 1.25
Cinnabar, New Mexico. In part xld. on rock. 4 x 3 x 1½. 7.50
Pyrargyrite, Freiberg. Xld. on rock. 2½ x 1¼. 8.00
Berzeliite, Langban. Xlline. mass on rock. 3½ x 2 x 2. ..... 6.00
Brucite, Texas, Pa. Xlline. 4 x 2. Fluorescent under long wave. 1.50
Leightonite, Chile: Well xld. in matrix. 4½ x 3. ..... 6.00
Epidote, Alaska. Group of fine large twin xls. (up to 1¼") 5 x 3. .... 15.00
Cervantite, Transvaal. With Stibnite. 3 x 2 x 1½. 2.00
Quartz w Phantom, Brazil. Fine green phantom in xl. 3 x 2¼. 5.00
Microlite, New Mexico. Bright yellow micro. xls. densely disseminated in Lepidolite. 3½ x 2½ x 1½. 7.50
Franklinite, Franklin. Large 3 x 2 xl. in specimen 4 x 2½ x 2. ..... 6.00
Fluorite, Cumberland. Very fine lilac & yellow banded twin xls. about 1¼" with Quartz & Calcite. 3 x 2½ x 2½. Very choice. 7.50
Azurite, Bisbee. Xld. stalactites w. some Malachite. 4½ x 3 x 2½. 10.00
Erythrite, Chile. Xlline. w. Smaltite in rock. 3 x 2 x 2. ..... 2.50
Epidote, Tyrol. Xld., no terminations. 2 x 1. ..... 1.50
Ilvaite, Seriphos. Large loose xl. 1½ x 1¼. 2.00
Cobaltite, Sweden. Good loose 7/16" xl. highly modified. 2.50
Argentite, Freiberg. Xld. mass. 2 x 1½. No gangue. 7.50
Babingtonite, Westfield, Mass. Large xls. w. Prehnite. 2½ x 1½. 2.00
Hetaerolite, Bisbee. Stalactitic. 3 x 2. ..... 2.00
Lepidolite, Western Australia. Large "book" xlline. plates. 5 x 4½. 2.00

Transportation extra. Terms cash with orders. Money refunded on unsatisfactory specimens returned within one week of receipt.

HUGH A. FORD

OFFICE AND SHOWROOM: 110 WALL STREET NEW YORK 5, N. Y.

Telephone: BOwling Green 9-7191

No lists furnished, but enquiries for specific minerals welcomed.

ROCKS and MINERALS
PUBLISHED MONTHLY

Edited and Published by
PETER ZODAC

FEBRUARY
1947

Contents for February 1947

CHIPS FROM THE QUARRY 102
SOME PROBLEMS OF LOCATION DESIGNATION. *By Ronald L. Ives* 103
THE GARNETS AT NATHROP, COLORADO. *By Guy B. Ellermeier* 109
QUINN QUARRY, BERKELEY, R. I. By Peter Zodac 110
SOME LOST MINERAL LOCALITIES OF NEW ENGLAND. THE MYSTIC QUARRIES. *By Prof. Charles Palache* 111
NICKEL MINES OF JAPAN 112
AN AMATEUR PALEONTOLOGIST IN EUROPE. PART 1—SCOTLAND. *By Harrell L. Strimple* 114
THE MYSTERY OF TROUBLESOME BROOK. *By Evelyn Waite* 116
QUARTZ CRYSTAL IN BRAZIL 117
WORLD NEWS ON MINERALS OCCURRENCES 118
SEMIPRECIOUS STONES IN BRAZIL 122
HELICOPTER TO BE USED FOR MAGNETIC PROSPECTING 124
MICA IN BRAZIL 126
THE AMATEUR LAPIDARY. MOUNTING A CABOCHON COLLECTION. *By Lucille Sanger* 128
CLUB AND SOCIETY NOTES 131
COLLINS HILL (PORTLAND, CONN.) DESERTED *By Richard Schooner* 135
WITH OUR DEALERS 136
BIBLIOGRAPHICAL NOTES 138
THE ROCKS AND MINERALS ASSOCIATION 139
INDEX TO ADVERTISERS 199

Entered as second-class matter September 13, 1926, at the Post Office at Peekskill, N. Y., under the Act of March 3, 1879
Copyright 1947 by Peter Zodac
Title registered in U. S. Patent Office

Specially written articles (as contributions) are desired.
Subscription price $3.00 a year; Current numbers, 35c a copy. No responsibility is assumed for subscriptions paid to agents and it is best to remit direct to the Publisher.
Issued on the 25th day of each month.
Authors alone are responsible for statements made and opinions expressed in their respective articles.
ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

We May Attend Convention

We have just received advanced notice of the 8th Annual Convention of the California Federation of Mineralogical Societies which is to be held in the Museum of Natural History, Santa Barbara, Calif., on May 23, 24, and 25.

Rocks and Minerals should be represented at the Convention and so we are planning to be present this year if—we can get away.

We intend to fly to Denver and to spend a few days in Colorado visiting friends and to make at least one short mineral trip. Mr. Richard Pearl, of Colorado College, in Colorado Springs, has invited us to call on him and this we intend to do (possibly he may be able to get away for a few hours to take us somewhere). Messrs. Eyles and Morse, of Bayfield, have long wanted us to call on them and this we may do also, especially as Mr. Eyles promised many times to take us to localities near and far.

We would like to stop in Utah and Nevada and may do so if opportunity permits as we have many good friends in both states.

California, that great state with its numerous mineralogical societies and fascinating localities and where we have hundreds of good friends, many of whom we know personally,—how shall we ever be able to do it justice in the few days we will have at our disposal? We should spend months in California, not three or four days! But alas! *Rocks and Minerals* must come out in June and we must return to see that it does.

New Magazine Issued

A new magazine, *The Earth Science Digest*, made its first appearance during the summer of 1946. The November (No. 4 issue) had such interesting articles as "Craters of the Moon", by Henry N. Andrews, Jr; "Famous Mineral Localities (Renfrew County, Ont., Canada)", by Jerome M. Eisenberg; "An Alaskan gold deposit', by Victor Shaw; "Gem wood of Kansas and Colorado', by Allen Graffham; a good description of Gem Village—the first and only gem colony in the U. S.; and "Jig-saw Giants", by Oscar A. Anderson.

This very interesting magazine—nicely printed with many good illustrations—is published monthly by the Earth Science Publishing Co. (R. B. Berry, Editor), Box 57, Omaha 3, Nebr. The subscription price is $2.00 per year (single copies 25c).

H. WIENER DIES

Just as this issue of the magazine was going to press, a subscriber from Tucson, Ariz., sent in a note informing us that Mr. H. Wiener, prop. of Wiener Mineral Co., Tucson, Ariz., passed away Jan. 13, 1947. As far as our correspondent knows, no one is taking care of the business and so it may not be continued. *Rocks and Minerals* will try to obtain more information for the March issue.

Wants More Eastern Articles!

Editor R&M:

You have gone Western with a vengeance. What is the matter with the East?

Ralph F. Hills,
Bloomfield, Conn.

Jan. 16, 1947

Alaska's Two Meteorites

The first known meteorite from Alaska is the Chilkoot Inlet which was found in 1881 at Chilkoot Inlet, Portage Bay. It consisted of one mass (iron) of 43 kgs (94.6 lbs) in weight.

The second known meteorite, Cold Bay, was found in June, 1921, at Cold Bay, on the Alaskan Peninsula. It was a pallasite and only 320 grams (.75 lb) in weight (two small fragments, 40 and 280 grams, respectively).

Moss Opal From Yuma Co., Colo.

What is believed to be a new locality for moss opal is an area 20 miles north of Burlington, Colo. The occurrence is on the Republican River (South Fork), in southern Yuma County, Colorado, and there is quite a sprinkling of the opal.

A small sample was sent to the Editor of Rocks and Minerals by Mr. Henry Y. Hoskin, of Burlington. It is of good quality, should take an excellent polish, and has a nice greenish fluorescence under the Mineralight.

ROCKS and MINERALS
PUBLISHED MONTHLY

Edited and Published by
PETER ZODAC

FEBRUARY
1947

SOME PROBLEMS OF LOCATION DESIGNATION

BY RONALD L. IVES
Vice-President, R. & M. A.

INTRODUCTION

In an unfortunately large number of instances, geologic and other reports supply a wealth of detail concerning some specific feature in a small area, but are most unspecific as to the location of that area. In consequence, much of the time spent in the field is devoted to finding the area, rather than to studying it.

History is full of accounts of explorers who made long journeys, but were not sure just where they had been; of wonderful lands, "somewhere beyond the horizon"; and of fabulously rich mines, "near the head of the Verde." A typical example is the journey of Sebastian Taraval, "El Peregrino," who made the first recorded crossing of California from the seacoast to the Colorado Delta (1774), but "came out lost," and was unable to retrace his steps (1).

Location designations differ somewhat from land surveys in that their sole purpose is to enable recovery of a site. If they are too general, valuable time is lost in the field searching for the site. If the designation is too specific, time is wasted in unnecessary accuracy, both in the original survey and in site recovery.

It should be obvious that a location cannot be described accurately unless the discoverer knows where he is, or has made observations so that he can find out where he was, prior to writing his report. Site designation requires that the location be described so that someone, not the original discoverer, can go to the place, at some later date, without difficulty.

LOCATION BY LATITUDE, LONGITUDE, AND ALTITUDE

Any fixed location on or within the earth can be recovered provided its latitude, longitude, and distance from the center of the earth are known.

Latitude is the angular distance poleward from the equator, which has zero latitude. Points north of the equator have north latitude: points south, south latitude. Latitude of either geographic pole is 90°.

Longitude is the angular distance, measured along the equator, east or west of the index meridian, which, in English-speaking countries, passes through Greenwich, England. As there are only 360° in a complete circle, any location having a longitude of more than 180° in one direction from Greenwich has a lesser longitude in the other direction, and the smaller figure is always used. For example, a computed longitude of 194° E would be stated as 166° W.

Distance from the center of the earth is not usually given directly, as the center of the earth is inaccessible. In its place, altitude above or below mean sea level, which is an accessible (approximately) spherical surface, is stated.

One degree of either latitude or longitude, measured at the equator, is about 69 statute miles (of 5280 feet each) long. Latitude degree, being everywhere measured along great circles, are (substantially) the same length everywhere. Degrees of longitude, however, are of different lengths at different latitudes, becoming of zero length at latitude 90°.

One minute of latitude (anywhere on earth) is approximately 1.15 statute miles, or 6072 feet, long; while one second of latitude is approximately 0.0191 statute miles, or 101.2 feet long. The length of a degree of longitude, for any latitude, can be computed by use of standard mathematics, although the process is quite laborious, or found from any standard reference on geodesy.

(1) Bolton, H. E. *Anza's California Expeditions*, Berkeley, 1930, Vol. 1, ix, 80, 110, 145.

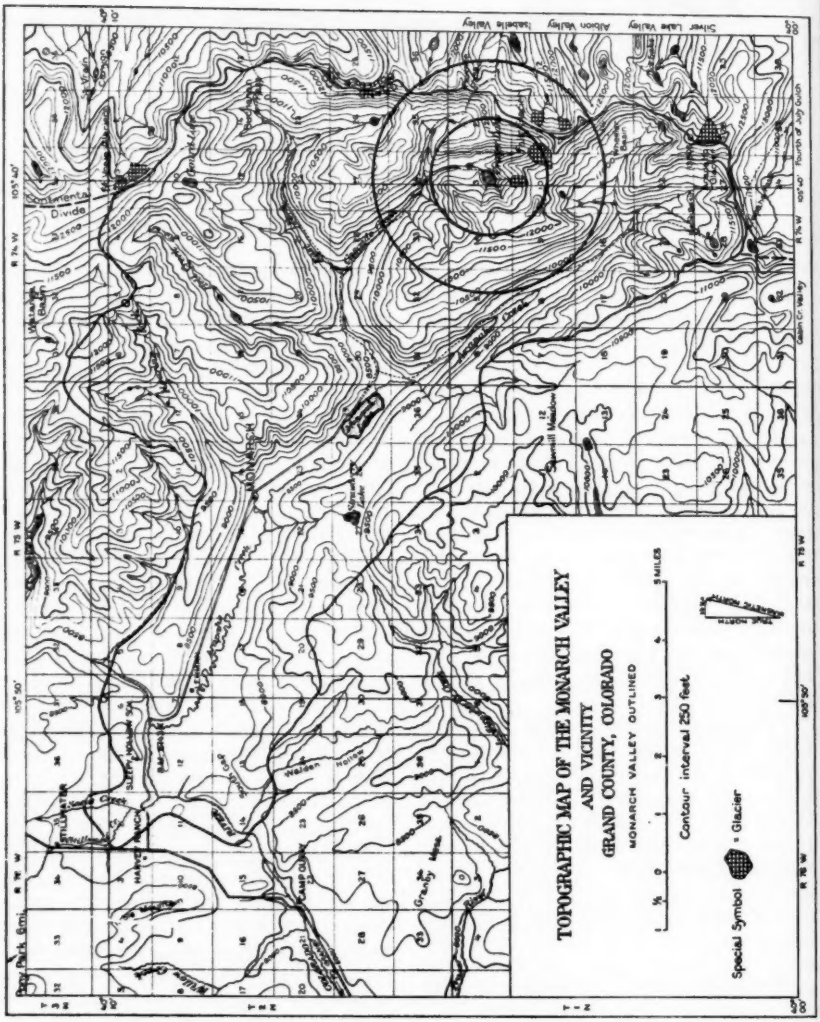


Fig. 1 Map of the Monarch Valley, Colorado. This excellent example of cartographic drafting is the work of Mr. L. B. Pusey, now chief of the Geologic Map division, U. S. Geologic Survey.

Location of Crater Lake (Fig. 1) according to this method of designation is —Lat. 40° 04' 36" N.; Long. 105° 38' 24" W.; Alt. 10,400' MSL. This places the lake accurately on the map. Location in the field, however, is another matter, due to limitations in the obtainable accuracy of navigational locations.

A skilled navigator, using conventional instruments carefully, under normal conditions, can place himself within a circle having a radius of about two miles. When all conditions are ideal, he may halve this error. Circles showing these errors are drawn about Crater Lake in Fig. 1. If expectable normal error occurs, some of the most rugged terrain in the state of Colorado might intervene

between the position of Crater Lake, as indicated by navigational methods, and the actual lake. Only if conditions were ideal would navigational methods even insure getting into the right valley!

From the foregoing, it should be apparent that location and designation by latitude, longitude, and altitude is of great value for fairly large features, and becomes less useful as the size of the feature decreases.

LOCATION BY INTERSECTION

From plane geometry we learn that the intersection of two lines determines a point. Practical application of this theorum to plane surveying is known as the *method of intersection.* If, from a given point, the bearings of two known points are determined, the position of the given point can be recovered, at any time, by finding the intersection of the respective "back azimuths" from the two known points.

This same principle can be applied to location designation on a specific map or photograph, using the two lower corners of the map or photograph as index points. This is shown diagrammatically in Fig. 2; the two "back azimuths," and their method of measurement, being shown by the letters *L* and *R* and their accompanying arcs.

Location of Crater Lake, by this method, using Fig. 1 as the specific map, is:—L 21°; R 65°. It should be noted that this designation is unchanged by any proportional enlargement or reduction of the figure (2).

LOCATION BY LATITUDE AND DEPARTURE

Any site can be recovered provided its specific relation to a definite index is known. This can be determined by finding the distance in a N-S direction from the index point to the site (latitude;) and then its distance from the index point in an E-W direction (departure); as in Fig. 3. The location of Crater Lake, by method of designation, in Fig. 1, or any compatible map, is:—2-1/3 mi. south of the outlet of Monarch Lake (latitude), and 4½ mi. east (departure), or:—4½ mi. north of Arapaho Pass (latitude) and ½ mi. east (departure).

(2) Ives, R. L. *Designation of Locations on Maps and Photographs,* Science, Vol. 93, 1941, 523.

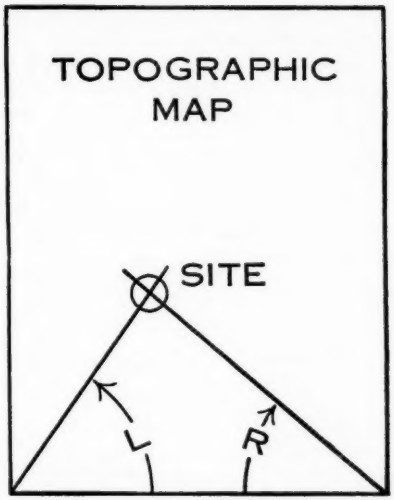
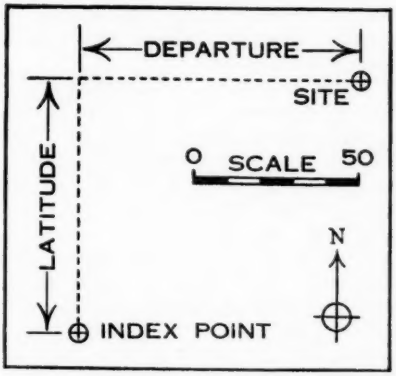


Fig. 2 Designation of a map location by intersection.

DESIGNATION BY BEARING AND DISTANCE

A site may also be located with reference to an index point by determining its bearing from the index point, and the distance between the point and the site, as shown in Fig. 4. This is one of



Fib. 3 Designation by latitude and departure.

the simplest and most convenient methods of designation.

Location of Crater Lake (Fig. 1) by this method is:—3 miles S 34° E of the junction of Cascade Creek and the East Fork; or:—5⅛ miles S 62° E of the outlet of Monarch Lake.

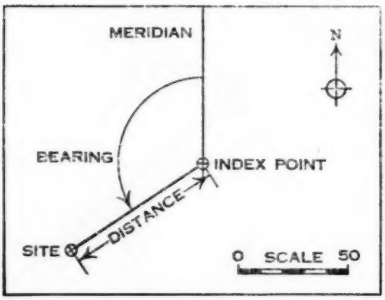


Fig. 4 Designation by bearing and distance.

LAND OFFICE DESIGNATIONS

In parts of the United States which were originally territories, much of the land area was surveyed according to the Township, Range, and Section system. By this method, areas six miles square are designated as townships, and areas nominally one mile square are sections. Townships are numbered sequently north or south of an index parallel, and sequently in ranges east or west of an index parallel. Sections are numbered serially, in a *boustrophedon* system (like ancient Greek writing) as in Fig. 5. Sections may be divided into halves, quarters, and so on.

Crater Lake (Fig. 1), according to this system, is located in the center of Section 3, Township 1 North, Range 74 West. This is commonly abbreviated as:—center, Sect. 3, T 1 N; R 74 W. As the early surveys were not as accurate as might be desired, and as "stakes in place", rather than land description, determines location, it is customary to state the political subdivision in which the land is located—in this case, Grand County, Colo.—rather than to refer to the index parallel and meridian.

"GRIDIRON" SYSTEMS

For locating sites on a map, a number

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Fig. 5 Sketch showing arrangement of sections in a township.

of coordinate, or "gridiron", systems are in common use. Most common is division of the map vertically into a number of lettered sections, while the comparable sections in a horizontal direction are numbered. This system places any site within a small rectangle. Many road maps are divided in this manner (such as the Rand-McNally series). Several minor and rather obvious modifications are occasionally used.

Another system, which theoretically permits infinite division of an area, has been outlined by C. F. Reed(3). Here, the area is divided into nine equal parts, each of which is also divided into nine parts, and so on. Numbering and arrangement of partts are shown in Fig. 6. This system is particularly useful when a large number of similar maps are to be used. The divisions can be drawn on a sheet of transparent celluloid or similar material, and this transparency scale used with all maps.

INDEX POINTS

As most systems of mapping and site designation require good index or reference points, choice of these markers is quite important. Index points should be permanent, recoverable, and easily found. Permanent index points include prom-

(3) Reed, C. F. *Science*, Vol. 93, 1941, 523.

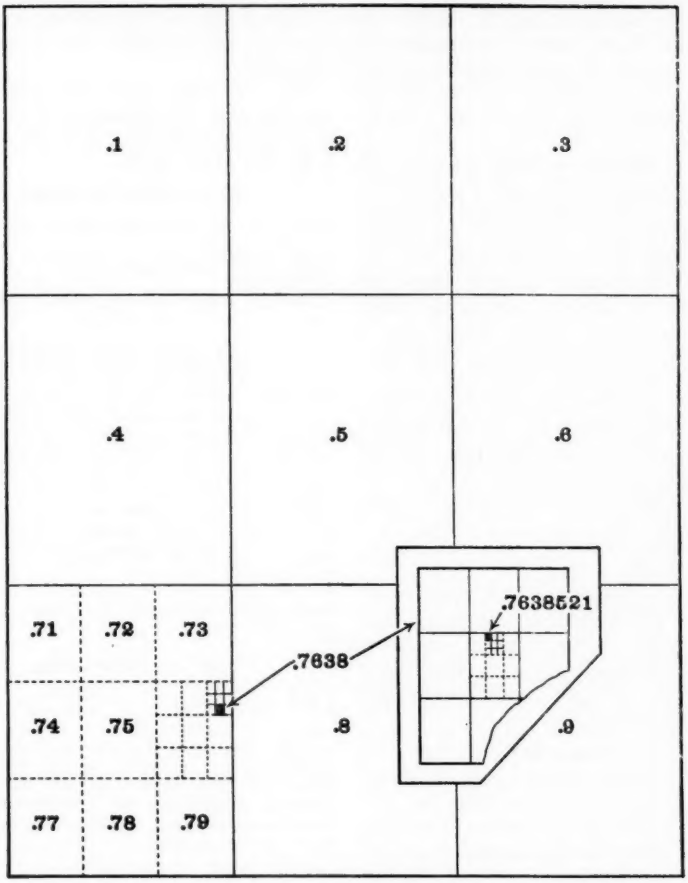


Fig. 6 Reed System of map division.

inent mountain peaks, major mountain passes, river features, if, cut in bed rock, prominent escarpments and outcrops, and shorelines, if of lasting materials. Some care in describing these indexes is desirable. For example, Bald Mountain, Colorado, is worthless as a designation, even if it is correct, for practically every mountain county in Colorado has at least one Bald Mountain. A better designation would be 'Bald Mountain, Niwot Ridge, Boulder County, Colo.", perhaps with either a latitude and longitude, or a township designation, to prevent any confusion.

Recoverable index points include those features which, while probably not permanent, can be relocated without too much trouble if they are destroyed. These include USGS and USC and GS markers, some section corners, major structures such as major highway and railroad bridges and tunnels, dams, patented mining claims, and prominent water holes and wells in arid regions. Because these features are normally "tied in" to re-

gional surveys, their location is recoverable even if the original marker is destroyed. Such points as haystacks and large trees are not good indexes, as their life is relatively short, and their locations, after some years, are not readily recoverable.

Where magnetic bearings are used, the location description should be dated, as magnetic north is not a fixed direction, but only a useful temporary approximation. True north, in contrast, has remained substantially constant since the invention of writing, despite a minor migration of the earth's poles, and is likely to "stay put", for all practical purposes, as long as man will need it.

Some attention to choice of index points is desirable. If it is stated that Ajo is south of Great Salt Lake, no one can object very strenuously; but, if Ajo is described as approximately 42 miles S 10° W of Gila Bend, Arizona; a field worker will have less trouble in finding the town.

In many instances, an index map, showing the relation of the area under consideration to some larger, easily-recognized, feature, such as the boundaries of a state, will save much trouble and misunderstanding.

SUMMARY

Several of the simpler methods of designating locations in the field, and on maps and photographs, have been summarily described and discussed. It should be obvious that there is no one perfect method, and that all of these methods, as well as many minor variations of them, have definite uses.

In general, the method used is determined by available time, instruments, and indexes; and by the knowledge of the field man. Attempts at increased accuracy, by carrying the computations out to more decimal places, are often a foolish waste of time. If the original survey is made by compass and pace methods, the final map will not be more accurate if computations are made by use of seven-place trig. tables in place of a slide rule. Likewise, if a site is located by celestial navigation, description should not be carried out to minor fractions of a second of arc unless it is certain that the measurements are comparably accurate.

Use of more than one method of location and of designation is advisable, when conditions permit as is use of more than two index points.

COLLATERIAL READING

Weems, P. V. H. *Air Navigation,* New York, 1938.
Lahee, F. H. *Field Geology,* New York, 1941, 382-712.
Tracy, J. C. *Plane Surveying,* New York, 1914.

Hill Issues New Catalog

V. D. Hill, Rt. 7-C, Box 188, Salem, Ore., has recently issued his new catalog, No. 20. It is a 32-page price list arranged as follows: Gemstones, pp.3-9; crystallized mineral specimens, pp.10-19; loose crystals, pp.20-25; synthetic rubies and sapphires (boules), p.26; meteorites, p.27; Virgin Valley fire opals, p.27; gold—silver—copper specimens, p.28; polished agate specimens, p.29; fluorescent minerals and lamps, pp.30-31; books, riker mounts, etc., p.32.

It is an attractive catalog, 6x9¼ inches in size, printed in large type, and has many good illustrations.

Burminco's New Catalog

Burminco, 128 So. Encinitas, Monrovia, Calif., has issued an interesting looseleaf catalog with a nice blue cover. This noted mineral firm specializes in quality mineral specimens, gem materials, and lapidary supplies. The first appearance of the catalog consisted of 30 pages but 3 additional pages were sent out a few weeks later. It is 8½ x 11 inches in size.

Michigan Lapidary's New Catalog

An attractive catalog, 8½ x 11 inches in size, nicely printed with many good illustration, was released during January, 1947, by Michigan Lapidary Supply and Research Co., 128 S. Woodward Ave., Birmingham, Mich. It consists of 29 pages and is devoted chiefly to lapidary supples.

R & M Has Grown!

Editor R&M:

Congratulations on the growth of the magazine. Your years of hard work and square dealing seem to be meeting with their just reward. I hope God will continue to bless your undertaking during the coming years.

W. Scott Lewis,
Hollywood, Calif.

Jan. 10, 1947

THE GARNETS AT NATHROP, COLORADO

BY GUY B. ELLERMEIER
1060 So. Gilpin Street
Denver 9, Colo.

The spessartite garnets at Nathrop, Colorado, are mentioned by Dana (1), though the text is confusing in regard to the garnet localities in the vicinity of Salida, in Chaffee County. To the writer's knowledge three varieties of garnet occur at five different localities within twenty miles of Salida. The huge dodecahedral crystals—almandite variety, partly altered to chlorite—that Dana mentions as occurring at Ruby Mt., do not in fact occur on that mountain, but are found at the old Sedalia copper mine located only a few miles north of Salida (2). Whereas the spessartite garnets he also mentions, and with which this article deals, occur in the rhyolite of Ruby Mt., situated just across the Arkansas River from the hamlet of Nathrop. These Ruby Mt. spessartites are such clean-cut little trapezohedrons that, seated in their rhyolite matrix, they afford interesting specimens. Moreover, they are reasonably accessible to the motoring collector, and a day spent there will recompense him for the time and effort involved.

The visitor to Ruby Mt. need not be concerned about the village of Nathrop, since the half dozen houses that comprise the hamlet are set almost out of sight from the highway. But he will maintain sharp watch for the Nathrop Postoffice which stands close on the west side of U. S. Highway 285, about eight miles south of Buena Vista, or eighteen miles north of Salida.

From the postoffice porch one may see Ruby Mt. standing out quite prominently on the eastern (i.e. opposite) bank of the river, the base of the mountain being no more than a stone throw from the water. In reality, Ruby Mt. is a hill somewhat over 200' high and slightly more than a quarter-mile long. It may be recognized by the light—gray—almost white—rhyolite composing the mountain. However, should the rhyolite be rain-soaked, it will assume a definitely purple tint while wet.

To arrive at the mountain, drive north from the postoffice about a half mile where a broad, bowlder-strewn, sagebrush flat parallels the highway along the east side. Turn off here onto the flat and park the car. Though fuel is scarce, one may camp there if not allergic to sleeping on stony ground enlivened by clumps of prickly pear.

From the camp-ground walk north along the railroad track, which cuts through the flat, to the river where the R. R. trestle will serve as a bridge. After crossing, turn back down stream and follow the general course of the river to the mountain. This means approximately a two mile walk.

On the west, or river side, the mountain offers a very steep ascent, while treacherous slide rock makes this approach a bit risky, as Wendell Mohr, Tyke Meissner and the writer were to learn by the hard way of experience. The junior members of our party, John Meissner and Gordon Schindel, we sent around to the northeast shoulder of the mountain where it may be scaled with less difficulty. Here the ascent is made by stages from one terrace to another until a high bench is surmounted. The bench extends the length of the hill, and from it the final climb is steep but short.

While on the terraces one may as well gather a few of the shiny black obsidian pebbles that strews the weathered surface. Some of the pebbles are transparent and will facet-cut into gems that resemble smoky quartz, though possibly lacking some of the latter's brilliancy. By casting about one may pick up a perlite spheroid with obsidian pebbles implanted therein. The lustrous gray perlite contrasts well with the black obsidian and will afford a pleasing specimen.

We found the most and best garnets along the crest of the mountain, and about midway of its length. Here one will note that much of the rhyolite is vesicular and often honeycombed by

lithophysal cavities. The garnets have formed in these cavities, though empty cavities are the rule rather than the exception. Thus it becomes a matter of splitting blocks and slabs of rhyolite until a garnet is encountered. Fortunately the garnets are firmly seated and few will be lost while trimming the specimens.

These garnets are noted for their brilliant, well-formed crystals. The color is deceptive. In sunlight they may seem quite red, though in other lights they appear dark brown or black. Dana mentions topaz as an accompanying mineral. We found no topaz on Ruby Mt. though we spent two days there. We are reliably informed, however, that topaz has been found there rarely.

Recently Mrs. Mary A. Piper, who has charge of exhibits at the Colorado State Bureau of Mines Museum, called the writer's attention to the minute dark granules that speckle some of the rhyolite. These granules are corundum, red in color under a powerful glass, she stated. Perhaps this accounts for the origin of the mountain's name; certainly it is the only known occurrence of the ruby in our state.

There is a way, occasionally used by local fishermen, by which a car may be driven to within a half mile of Ruby Mt., though it is not recommended during rainy periods. Drive about a mile and a half north from Nathrop, keeping close watch for a dirt road that leads toward the river. This takes one on past the sagebrush flat mentioned earlier. A fair bridge spans the river. Just beyond the river this road takes a northerly turn and leads to an abandoned house. From here on the road is hardly more than two ruts that trend in an easterly direction almost to the base of the main mountain range. Here the trail turns south and will eventually thread its way across a mesa strewn with bowlders even larger than the car. Thus one has, naturally, doubled back toward Ruby Mt. At the far end of the mesa the trail ends at the brink of a declivity. Here one may camp in comfort with shade and fuel. At the foot of the declivity is a spring that not only affords potable water, but a salad for the table as well, since wild watercress grows in profusion along the brook formed by the spring. From this point a small hill obscures the view of Ruby Mt. which stands a half mile beyond. We met no obstacles when driving in by this route, but when outward bound we brushed shoulders with trouble—mud.

We are grateful to Mr. Harmon Meissner for furnishing transportation and for the dinner of rainbow trout which he caught in the river while we were collecting garnets.

REFERENCES:

(1) Dana's Textbook of Mineralogy, 4th Ed., p. 596

(2) Garnets of Salida, Colo., by Allan Caplan, *Rocks and Minerals*, July 1936, p. 104.

Quinn Quarry, Berkeley, R. I.

BY PETER ZODAC

Rhode Island, the smallest state in the Union, has been so thoroughly covered, mineralogically, that any new occurrence is of more than passing interest. On Sept. 8, 1940, accompanied by Ken Pugsley, of Pawling, N. Y., a visit was made to Berkeley, a few miles north of Providence, where a large crushed stone quarry was examined. The quarry was at the end of First Street (300 feet east of R.I.Rt.122) and was operated by L. J. Quinn & Son, Inc. (contractors). It was about 300x200 x 75 feet high at the face. The main rock quarried was gneiss.

Only one interesting mineral, however, was found—pyrite. It occurred as tiny lustrous cubes in a schistose rock. Fair specimens of epidote and massive milky quartz, both in gneiss, were quite common.

W. S. Winslow, Jr., in his "Catalog of the Minerals and Mineral Localities of Rhode Island" (issued in 1945 for private distribution) lists only 4 minerals (p.18) from the quarry as follows: Melanterite ("alum"), tourmaline, chalcopyrite, and fluorite (as a coloration). The 3 minerals we found boosts the total up to 7.

SOME LOST MINERAL LOCALITIES OF NEW ENGLAND

III. The Mystic Quarries, Somerville, Mass.

BY PROF. CHARLES PALACHE
Cambridge, Mass.

In the side of one of the seven hills of Somerville, in its eastern portion, looking out to the marshes of the Mystic River, two large quarries were opened in the Cambridge Slate, a Carboniferous formation. The slate was intersected by dikes and sills of diabase and at the fractured border of the intrusions there was developed a complex of veins of quartz and calcite much like those already described at the Holland St. Quarry. The veins were however larger, up to a foot in diameter, and were accompanied by pyrite, often in abundance. Where the pyrite had found its way into the joint planes of the slate it was often very well crystallized in sharply striated cubes. I have already told of finding a few veins in this quarry containing brookite and anatase, revealed only by etching out the sealing calcite. Open veins were so rare that I cannot recall ever seeing a cavity. But one day my friend, J. C. Rand, of whom I shall have more to tell in another place, came to me in great excitement with a fairly large vein specimen from this quarry which he had come upon by a lucky accident. Some of the slate and all the diabase was crushed for road-metal in a very crude contrivance. The crusher stood on the level quarry floor and the rock was carried in dump carts up a ramp to an elevated platform where it was dumped to be thrown into the crusher. Rand visited the quarry on a Saturday afternoon after the men had stopped work. The last load of the day lay on the platform and on it was this specimen all ready to fall into the jaws of the stone crusher. It is a lens-shaped opening in a vein, lined with attractive calcite crystals of simple form and dusted over their entire surface with tiny, rather iridescent crystals of pyrite. Common

(Continued on page 138)

Calcite crystals coated with iridescent crystals of pyrite. Mystic Quarries, Somerville, Mass.

NICKEL MINES OF JAPAN

(Bureau of Mines Mineral Trades Notes, Nov. 20, 1946)

T. G. Andrews, scientific consultant, states in Report No. 57, Natural Resources Section, GHQ, Supreme Commander for the Allied Powers (SCAP), that Japan has no important nickel deposits and depends chiefly on imports to meet its industrial needs. Production of nickel in Japan began in 1937 and was obtained from eight mines, four producing nickel concentrates and four producing nickel-bearing iron ore. A list of the nickel mines follows:

Nickel mines in Japan proper, 1945

MINE AND COMPANY	LOCATION	GEOLOGY
Nisso Mining Co. Oya	Yabu-gun, Oya-mura, Hyogo	Nickel minerals with sulfides in brecciated serpentine
Nasaji Hitotsumatsu Okushibetsu	Tsuchikawe-gun, Kamishibetsu-mura, Hokkaido	Disseminations in gabbro
Tokachi Nickel K.K. Tokachi	Hiroo-gun, Hiroo-mura, Hokkaido	Dissemination and veins in diorite
Seikan Mining Co. Ltd. Bihoro	Hiroo-gun, Hiroo-mura, Hokkaido	Dissemination and veins in diorite
Asaji Kumumoto Horoman	Samani-gun, Samani-mura, Hokkaido	Disseminations and masses of Ni-pyrrhotite in gabbro
Chogyamori mine[1]	Shimohei-gun, Okuni-mura, Iwate	Replacements and disseminations in Paleozoic rocks and granodiorite
Tenryu Mine[1]	Shimoina-gun, Yaeka-wachi-mura, Nagano	Disseminations in gabbro
Abe-gawa district	Yabe-gun, Ikawa and Tamokawa-mura. Shizuoka	Replacements or contact deposits related to serpentine
Misukubo-machi dist.	Suohi-gun, Misakubo-mura, Shizuoka	Quartz veins in schist
Sasayama[1]	Ono-gun, Nyukawa-mura, Gifu	Vein in Paleozoic rocks associated with serpentine
Kagura[1]	Hyojyo-gun, Soji-mura, Hyogo	No information available.
Kimpo[1]	Tsudo-gun, Kodo-mura, Yamaguchi	Replacements or contact deposits related to serpentine
Nifu[1]	Kitaamabe-gun, Nifu-mura, Oita	Replacements or contact deposits related to serpentine
Wakayama[1]	Ono-gun, Oita	Replacements or contact deposits related to serpentine
Chiyogahara[1]	Higashiiwai-gun, Otsubo-mura, Iwate	Disseminations in sandstone near diabase

[1] Owners not known.

Only the Oya, Okashibetsu, Tokachi, Bihoro, and Horomon mines operated during the war. The Oya mine produced 83 percent of the recorded total production. The mine, 21 kilometers west of Yabu, is reached by a narrow gravel road from Yabu. Of the three deposits (Oya, Natsume, and Nakamura) included in the Oya mine, the Oya produced about 75 percent of the ore

mined. The crude ore, assaying 0.52 percent Ni, 0.04 percent Co, 16.64 percent Fe, 1.98 percent S, 10.12 percent CaO, 11.36 percent MgO, 14.66 percent Al_2O_3, and 37.29 percent SiO_2, is concentrated in a flotation mill on the property. Concentrates were sent to the Chigirishima smelting plant of the Teihaku Kohatsu Co. Mining cost at the Oya deposit in 1945 was Y71.66 and milling cost Y55.83 a metric ton.

The Oya mine ceased operations in September 1945; the mine openings have caved, and much work would be involved in reopening the mines.

Production of nickel-bearing iron ore was mostly from the Oeyama, Wakasa, Kamogawa, and Omiishi mines. A list of the nickel-bearing mines in Japan proper follows:

MINE AND COMPANY	LOCATION	Estimated reserves	
		Metric tons	Percent Ni
Nippon Yakin Kogyo Co. Oeyama	Yozagun, Yoza-mura, Kyoto	6,638,364	0.5
Mori Kogyo Co. Wakasa	Oi-gun, Hongo-mura, Fukui	49,276,809	0.5
Kamogawa Nickel Kogyo Co. Kamogawa (Mineoka)	Awa-gun, Tawara-mura, Chiba	2,000,000	0.3-0.7
Toyo Denki Kogyo Co. Kamikawa	Kamikawa-gun, Kamii-mura, Hokkaido	350,000	0.7
Nippon Nickel Kogyo Co. Oniishi (Tano) (Yashio)	Tano-gun, Oniishi-machi-mura, Gumma	[1]	[1]
Kotaro Kitazuma Hakusan	Ono-gun, Hukusan-mura, Oita	1,500,000	0.6
Yasujiro Nako Ryuten	Akaiwa-gun, Nibori-mura, Okayama	35,000,000	0.41
Toa Kogyo Kaihatsu Kogyo Omukai	Tsuno-gun, Kano and Kodo-mura, Yamaguchi	2,142,000	1.1
Totaku Kogyo Co. Niyagawa	Suwa-gun, Niyagawa-mura-Nagano	[1]	[1]
Shoei Mining Co. Shoei	Esashi-gun, Utanobori-mura, Hokkaido	135,000	0,4
Shizuke mine	Suwa-gun, Miyakawa-mura, Nagano	[1]	[1]
Miwa mine	Kamiina-gun, Miwa-mura, Nagano	[1]	[1]
Urakawa mine	Iwata-gun, Urakawa-mura, Shizuoka	25,000	0.55
Yamayoshida mina	Yana-gun, Yamanoyoshida-mura, Aichi	10,000	[1]
Oshima mine	Oi-gun, Wada and Oshima-mura, Fukui	[1]	[1]
Daidori mine	Tsuno-gun, Kodo-mura, Yamaguchi	[1]	[1]
Notsuhara mine	Oita-gun, Notsuhara-mura, Oita	700,000	[1]

[1] Not available.

The nickel-bearing iron ores were obtained chiefly from nickel-bearing residual clays derived from serpentine. These clays contain 0.3 to 0.8 percent nickel and 20 to 25 percent iron. The ore was used primarily in electric furnaces or rotary kilns to make nickel pig iron, which contained about 2 percent nickel. The Oeyama, Miyagawa, and Urakawa mines shipped 4,417 tons of

crude ore to the Niihama refinery, where 571 tons were treated and 3.4 tons of nickel recovered. As far as can be determined from mine, smelter, and refinery records, these are the only ores of this type from which metallic nickel was obtained.

The Oeyama mine, 10 kilometers south of Iwataki, can be reached by a two-lane gravel road from Iwataki or by railroad from Kaya. The deposit covers nearly 2,000,000 square meters and varies in thickness, the average thickness being 15 meters.

The mine was worked by open cuts by hand labor, the ore was dried at the company's plant and then shipped to the sintering plant at Iwataki, where pig iron was made. Cost of producing wet ore in 1945 was Y13.97 and dry ore Y35.97. The mine was not operating when visited in April 1946; and because of the low grade of the ore, it cannot be operated profitaly without subsidy.

The Wakasa mine is on a small peninsula projecting into the Sea of Japan. A spur track, completed just before the cessation of hostilities and never used, connects with the main line at Wada station. All mining was by open cut and by hand labor. During the war, the ore was loaded into boats and carried across the bay to Hongo. It was then shipped to the Nanoo plant of the Iwaki Cement Co., Ltd., the Yawata plant of the Nihon Seitetsu Co., Ltd., and the Koumi plant of the Showa Denko Co., Ltd. Analyses of the nickel-bearing clay showed 0.52 percent Ni, 35.74 percent Fe, 1.65 percent Cr, 0.11 percent Co, 0.87 percent Mn, and 11.45 percent SiO_2. The mine was not operating when visited in April 1946, but the owners hoped to begin operations and sell the ore as iron ore. It is doubtful, however, that the mine can be operated economically, as the ore is very low-grade.

AN AMATEUR PALEONTOLOGIST IN EUROPE

Part 1—Scotland

BY HARRELL L. STRIMPLE
Bartlesville, Okla.

When the fateful alert—Overseas—came at 2:00 a.m. in Drew Field, Florida, a multitude of thoughts raced through my mind and at least two of them would seem peculiar to the normal individual. I hoped that if it were the South Pacific it would be possible to get to the Island of Timor in the Dutch East Indies where the fantastic "Permian of Timor" crinoid (ancestrial to the star-fish) fauna is found, and if it were the European Theatre of Operation that I could visit with the eminent Scottish geologistt, Mr. James Wright. Such things were so far beyond the control of an individual when a member of the Armed Forces that they must be termed "wishful thinking." We landed in the mouth of the Clyde River below Glasgow, Scotland, but were soon on trains rolling southward through the evening and night, ending our journey in a Replacement Depot of the 8th Air Force near Manchester, England.

The trip in the small, easy running English train was a revelation for one does not expect much comfort in the army, especially in a foreign country. There are no doubt several technical reasons, such as small size, etc., but it was my observation that the English trains operated more smoothly and efficiently than ours. It was fall and the vivid green countryside sprinkled with old English homes and villages was really beautiful. One had the feeling of looking at beautiful pictures in a rare old book. At the moment the weather was decent and the people quite friendly, a few weeks later the rainy season set in along with the miserable damp cold—and remained. Along with the usual discomforts of a replacement center, life was quite miserable. In the camp library I came across one of Robert L. Stevenson's little known books, "St. Ives," in which Edinburgh Castle played a prominent part but Edinburgh seemed very

remote. Some three weeks later I was standing in Prince's Street looking up at the castle—c'est la querre.

One of those peculiar "breaks" had occurred and I was assigned to the 815th Signal Port Service Company, with headquarters in Glasgow, Scotland. I wasted no time in obtaining an overnight pass for Edinburgh, the most beautiful city in Britain. It is impossible to describe the delight of sitting with the great scientist and discussing geological problems, of the very gracious hospitality bestowed by his delightful sisters. Imagine a plain G.I. many months away from home, in a strange land, sleeping in silk pajamas on a mattress soft as a caress with a hot water jug at the foot. It was overwhelming.

For those who question the possibility of a person without benefit of a "formal" education achieving scientific recognition, Mr. Wright provides the perfect example.. A few years ago he was presented with the coveted Neilston Award. Many hours were spent in an effort to absorb some of his kindly philosophy and tremendous paleontological knowledge. We went over his magnificent crinoid collection and eventually even collaborated[1] on a problem with interlocking ramifications. From one window the famous Firth of Forth bridge was visible (on clear days), the Pentland Hills (Silurian) were to the south and a few minutes away by tram (streetcar) was Craiglockart Hill—a special columnar basalt taking the name of the hill. Those were great days, the weather even permitted us to go to Kirkcaldy, across the Firth, and collect in the small quarry at Invertiel, known internationally due to Wright's researches. Very few specimens were found but one dorsal cup of Hydreionocrinus showed specialized development, which made the trip quite worth while.

The Royal Scottish Museum, in Edinburgh, was closed as such but Dr. Stevens was kind enough to allow us to go to the basement and study the crinoid collection stored there. Another time we went to the library of the Royal Scottish Geological Society, also in Edinburgh, to look up some references in the Paleo. Indica.

In the meanwhile time was not being entirely wasted in Glasgow. I made quite a few visits to the Hunterian Museum in the University of Glasgow which was arranged primarily for the use of students and was thus ideal for me. There were many beautiful echinoderms but the fossil fish probably constituted the most interesting display. Another amateur, Mr. Thomas Begg, an authority on Trilobites, and his family were especially hospitable and he presented me with a rare collection of trilobites from the Ordovician of Girvan, Ayrshire, in southwesteren Scotland.

Aside from casual observation of various geological occurrences for which Scotland is famous probably the most interesting exhibit was the Fossil Grove in Victoria Park, Glasgow, where an ancient (Carboniferous) grove of trees has been excavated and the area enclosed in a glass building. My first view was an excellent small scale replica exhibited in Kelvingrove Museum.

It is interesting to note that on holidays the Kelvingrove Museum was actually crowded with throngs of people but this was partially due to limitation of entertainment possibilities.

The friendliness, hospitality and beauty of Scotland provide cherished memories. Knowledge gained there could never be replaced.

---

1 Mooreocrinus and Ureocrinus gen. nov., with notes on the family cromyocrinidae: Geological Magazine, LXXXII, No. 5, 1945, James Wright and Harrell L. Strimple.

Gem Exchange New Price List

The Gem Exchange, Bayfield, Colo., has also issued a new price list during January, 1947. It is 3¾ x 9 inches in size and consists of 18 pages. It is devoted chiefly to gem cutting materials and supplies. The sources of the minerals in stock are arranged alphabetically by states and countries.

THE MYSTERY OF TROUBLESOME BROOK

BY EVELYN WAITE
242 Scarsdale Rd.
Crestwood Tuckahoe, N. Y.

Where did they come from, and how did they get there? These are the questions which remain to be answered, challenging our detective abilities, and spurring our efforts to find more specimens of similiar character.

"They" are four, good-sized and heavy, pieces of a large Stalactite or Stalagmite which have been found among the rocks in the bed of Troublesome Brook (a tributary of the Bronx River) which has its origin in the hills west of Central Ave., above Scarsdale or Hartsdale and flows into the river at Crestwood, all in Westchester county, in southeastern New York State.

But let us tell the story from the beginning.

On Sunday afternoon, Jan. 19th, 1947 a young boy, David Shetzline, called at our house to show us a specimen he had picked up in the bed of Troublesome Brook, near St. Eleanor's Convalescent Home in Crestwood. When the writer saw the specimen (which weighed 4 or 5 lbs.) she forgot all about previous plans to go skating, and changing only the pet nylons, hastened to pack the boys, brother and nephew included, into the car to go in search of other specimens if there were more to be found.

For the specimen the boy had brought in was obviously a piece of a Stalactite or Stalagmite, which, as far as the writer knows, is totally foreign to this part of the State, at least. It was of a light, honey-color shading to brown, very fine grained or sugary looking, and banded with darker, reddish-brown parallel or concentric bands on the inner surfaces, almost like Agate.

The section the boy had was "folded" lengthwise, like a drape or curtain, as these formations frequently are, and was quite smooth on all surfaces, somewhat water-worn (all edges rounded), and fluoresced nicely under the black-light bulb.

On arriving at the spot, which is just below the Falls above St. Eleanor's Home, we all scrambled down into the stream bed, from which, fortunately, most of the ice had disappeared. Almost immediately David found another and larger piece, followed by another found by Bob Creacy and then one by the writer.

Look as we would, we could find no more and the day and the water were both much too cold for much poking about, so we finally gave up and searched the surrounding rocks, walls and the stream-bed up to the lake where skating was in progress, but to no avail. We found no more.

The boys were very thrilled to have discovered what they did and vowed to go back as soon as weather and water are warmer and tear apart the pile of debris below the Falls in search of more specimens.

When we got all the pieces in the car we found they all fitted perfectly together, making a section 14 inches long by 8 inches in diameter. Judging by the size and shape of the re-constructed specimen it must have been at least 6-12 inches longer or even more, on the point end, depending probably on whether it was a Stalactite or a Stalagmite, for if it hung down from the ceiling of cave or other formation, as do the first mentioned, it would probably have had a longer and more slender point, than if it were built up from the floor by impregnated waters dripping and solidifying on the spot, as is a Stalagmite.

Tho' it is well-known that Westchester County has limestone and marble deposits, particularly between Tuckahoe and Scarsdale, running north and south parallel to the Bronx River, on both sides of it, and not more than a couple of blocks east of Troublesome Brook, which comes from the northwest and flows parallel to the Bronx River for about a mile before joining it, and also that Calcite was found in the tunneling for the Delaware Water project, which had an opening,

(Continued on page 121)

QUARTZ CRYSTAL IN BRAZIL

(Bureau of Mines, Mineral Trade Notes, Nov. 20, 1946)

In the third quarter of 1945, the last full quarter of activity by the U. S. Commercial Co., quartz-crystal purchases declined sharply, although both the U. S. Commercial Co. and private trade were buying piezo-electric quartz. Quartz crystal exported to the United States during the last half of 1945 was worth on the average, about $US10 a kilogram. Total production in the period for the United States and the United Kingdom, by months, was as follows:

1945	Metric tons
July	56
August	37
September	29
October	49
November	32
December	21

All producers were warned of the impending termination of the Government procurement, which accounts for the large tonnage in October.

Exports of quartz crystal in the first 6 months of 1946 were as follows:

1946	Metric tons
January	9
February	42
March	20
April	17
May	3
June	8

Of the 42 tons exported in February, 30 tons was "lasca," or fuzing quartz. The average value was about the same as in 1945 ($US10 per kilo). Mining was greatly reduced, and no new prospecting or developing is being done. It is expected that the export volume will be continued at 10 or 12 tons a month.

As is well known, Brazil has been the world's best source of quartz crystals of piezo-electric quality, and that used by the Allies in World War II came chiefly from this country. It occurs in relative abundance in the States of Minas Gerais, Goiaz, and Baia. Much of the production is from widely scattered unorganized sources and shallow surface deposits worked by hand. Only a small proportion of the quartz found in these deposits is suitable for industrial purposes. Some selection could be made at the mine, but during the war the final grading and classifying was done in the laboratories of the U. S. Commercial Co., where testing was done in an oil bath by the ray of an arc lamp.

Quartz crystal has been found in four types of deposits. The least important, from the standpoint of volume, is the true alluvial in which the crystals have lost their crystal form and are found as rounded pebbles. The type most commonly exploited was quartz found in the residual surface mantle resulting from weathering and decomposition of sandstone, shale, or granite that contained veins, veinlets, or lenses of quartz. Another type consists of quartz beds, lodes, or veins in sandstone, shale, or granite that is weathered to a considerable depth. Still another type consists of irregular bodies of quartz accompanied by small veinlets along joints and other fractures in the sandstones, as in the Serra do Cabral in Minas Gerais.

The method of mining quartz crystal is based upon the type of occurrence and is therefore of many types. The simplest is the gathering of the rounded alluvial pebbles of quartz from the streams. In residual deposits, large open cuts are put down by hand shoveling the material upward from bench to bench, sometimes handling dirt as much as twelve times. This has been replaced largely by the use of a small mine car pulled up an inclined track by a gasoline-powered hoist. Where the size and topography permit, bulldozers and wheel scraper have been used to remove overburden and to reduce hand digging. In a few instances, hard rock, requiring compressors for drilling and blasting, has been encountered. Blasting, however, is kept at a minimum to avoid shattering the crystal. At Curvelo, Minas Gerais, and near Campo Formoso, Baia, underground mining was

(Continued on page 137)

WORLD NEWS ON MINERAL OCCURRENCES

(Bureau of Mines Mineral Trade Notes, Nov. 20, 1946)

ANTIMONY

Honduras.—The El Quetzel mine in the extreme west of Honduras, which shipped small quantities of antimony to the United States during the war, has been closed as its inefficient methods and expensive transportation to the coast does not permit profitable mining at present prices. However, Manuel Bueso and Rudolfo Nater, owners of the mine, have applied for a contract to exploit various other scattered antimony deposits and to install a mill for processing the ore in Honduras, thus saving on transportation costs. (Vice Consul Albert K. Ludy, Jr., Tegucigalpa.)

CHROMITE

Brazil.—Chromite is found in five zones in Brazil—three in Baia, and one each in Minas Gerais and Goiaz. Of the three in Bais, Campo Formoso, operated by Chromita do Brasil, S/A, is the largest, having an estimated reserve of 4,000,000 metric tons of 35-percent ore. Chromita do Brasil S/A reports producing and shipping to Sao Paulo about 300 tons of chromite monthly. The second zone, that of Santa Luzia, has about 100,000 tons of ore containing 36 to 42 percent Cr_2O_3; and the third, the Boa Vista deposit has a minimum reserve of 20,000 ons containing 30 to 36 percent Cr_2O_3.

Chromium Mineracao S/A, operating a deposit near Picui in the State of Minas Gerais, states that owing to the high cost of sorting the ore to a shipping grade, and transportation costs, it is impossible to operate at a profit.

Samples of ore from the vicinity of Pouso Alto, in the State of Goiaz, assayed 41 to 42 percent Cr_2O_3.

GOLD

Brazil.—Production of gold in Brazil during 1945 was as follows:

	Grams
St. John del Rey Mining Co.	4,580,623
Cia. Minas de Passagem	385,251
Cia. Brasileira de Mineracao S/A	66,525
Minas Leao Jr., Limitada	40,777
Others, estimated	1,526,824
	6,600,000

The St. John del Rey Mining Co. treated 345,500 tons of ore containing 13.21 grams of gold per ton in 1945, compared with 361,700 tons containing 13.22 grams per ton in 1944. Ore reserves were reported at 8,741,000 tons averaging 12.105 grams a ton. It is unofficially reported that the company is considering closing the mine because of increasing mining costs, which have increased from 34s 7d a ton in 1941 to 65s 1d a ton in 1945. The mine workings have reached a maximum depth of 8,200 feet, but no work is being done below the 5,000-foot level. About 4 years ago, diamond drilling disclosed an ore body estimated to contain 6 million tons of ore containing an average of 14 grams per ton. It seems, therefore, that in spite of increased costs the company can continue to operate profitably for many years.

Passagem gold mine reserves average 5 grams of gold a ton and are probably not extensively developed. A block of 1,300,000 tons of pyrrhotite ore containing about 2 grams of gold a ton has been bypassed, the company planning to mine this ore when equipment for concentrating and roasting the pyrrhotite for the production of sulfuric acid becomes available.

The three following mines in central Minas Gerais are reported to be ready for production or finishing development work:

Bico da Pedra, 18 kilometers southwest of Ouro Preto, acquired by the present owners in 1941, is a small underground development reported to average 5 grams of gold per ton. A 100-ton-daily-capacity mill is nearly completed.

Santa Quitera, 6 kilometers from Santa Barbara, is a small vein carrying free gold. A new vein or a previously unknown part of the vein has been discovered. It is proposed to build a 20-kilometer power line and install a mill.

Sao Bento, 7 kilometers from Santa Barbara, is controlled by Canadian capital. Diamond drilling has been carried on since 1944, and it is unofficially re-

ported that plans call for the installation of a 250-ton-daily-capacity mill.

Honduras.—The New York & Honduras Rosario Mining Co. continued to be the only significant producer of minerals in Honduras during the first half of 1946. In addition to operating the Rosario mine, the company is developing mines at Yuscaran, El Transito (near the south coast), and El Mochito. A sample shipment of gold concentrates was made by the Agua Fria Mining Co., which resumed development of the Agua Fria mine after 3 years of inactivity. The mine is expected to be producing within a year. The Pan American Mining & Development Co. is still engaged in developing placer mining at El Vijao, in Olancho.

TIN

Argentina.—The alluvial tin deposits in Jujuy have shown a steady decline in production since 1938, when production was 2,385 metric tons. During the first half of 1946, production was only about 30 tons. By the end of June, preparations were being made to change from mechanical to manual mining, which will further reduce production. The ore contains about 55 percent tin. Tin also is obtained from silver-tin concentrates, normal production of which is about 1,200 tons a year. There are three types of concentrates that contain 15 to 40 percent tin. The export of metallic tin is prohibited, whereas the export of tin ore in rigidly controlled and in effect prohibited if valuable for its tin content. Argentine tin ores are smelted locally and leaves a tin slag containing about 10 percent tin. As there are no facilities for the economic extraction of the tin from the slag, it is exported, chiefly to England. (Second Secretary of Embassy John Ordway, Buenos Aires.)

TUNGSTEN

Brazil.—Scheelite was first discovered in February 1942, and by October 1943 about 60 deposits were known. The scheelite belt in the States of Rio Grande do Norte and Paraiba covers about 15,000 square kilometers of the Borborema plateau. Deposits of scheelite are confined to the micaceous schists of the Serido series, which form gigantic roof pendants in the granitic batholith of the Brazilian shield. The walls of beds or lenses of marble or amphibolite guided the mineralizing solutions. In a typical deposit, an aureole of scheelite-bearing tactite is found surrounding a barren lens of marmorized limestones. No deposits were found on the granite contact itself, the laterial distance to the intrusive ranging from 50 meters up to several kilometers. The boom in scheelite mining had its peak in August 1943 Over 10,000 men were employed, and as much as 50 metric tons of high-grade concentrate have been produced in one week. All mining was by the crudest methods—hand digging, crushing with sledge hammers, picking, and panning the concentrate by hand. By paying the workmen less than 50 cents a day, the richer mines could place tungsten concentrate f.o.b. Brazilian port for about $US11.50 a short-ton unit of 65-percent WO_3. All easily mined scheelite is worked out, and shippers now must stand deductions for impurities.

The Inhandjara wolframite mine near Jundiai, in the State of Sao Paulo, is said to be stocking its concentrates "because the United States import tariff is too high."
(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

ASBESTOS

Brazil.—The most important deposit of asbestos is that of Pocoes, near Joquie, in the State of Baia, which is being worked by the S. A. Mineracao de Amianto, who have a plant for the production of 1,500 kilograms of asbestos per 24 hours. The fiber is said to be class 3. This is chrysotile asbestos, but most of the known deposits in Brazil are classed by the Departmento Nacional da Producao Mineral as tremolite. The indicated reserves are 4,600,000 metric tons of an average content of 2.5 percent asbestos fiber. The output is utilized in the manufacture of cement-asbestos products such as pipe and roofing sheets. The quantity of asbestos produced is not known.

According to Charles Will Wright, chrysotile of usable quality is found at Beija-Flor near Uba, Minas Gerais, about 120 miles north of Rio de Janeiro on the railway to Ponte Nova. Another deposit of chrysotile in 5 miles south of Nova Lima, Minas Gerais, on the property of the St. John del Rey Mining Co. Exploration by surface cuts has disclosed scattered patches of long-fiber chrysotile as well as extensive areas of short-fiber in a serpentine belt.

At Dois Irmaos, 18 kilometers from Pontalina, in the southern part of the State of Goiaz, veinlets of chrysotile asbestos have been found in a serpentine outcrop 40 meters above the gneissic peneplain. Other occurrences of asbestos are known in Goiaz, Minas Gerais, Baia, Rio Grande do Sul, Sao Paulo, State of Rio de Janeiro, Paraiba, Rio Grande do Norte, Pernambuco, and Ceara. These are undeveloped and only of doubtful value; much of the a bestos is of poor quality.
(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

EMERY

Turkey.—The brisk demand from various European countries as well as from the United States for Turkish emery ore continued throughout the second quarter of 1946, according to Vice Consul Ellis A. Johnson at Izmir. However, transport difficulties in both the interior and on the sea prevented normal developments in the trade. The mine owners were still unable to purchase trucks for transporting the ore from the mines to the sea, and the private transport firms also were unsuccessful in obtaining quotas from the imported trucks, which were entirely taken by Government administration establishments.

Mine owners also complained of the high freight charged by steamship agencies for emery to be shipped to the United States. It was said that the minimum charge for emery ore from Turkish ports to the United States was $14 per ton (20 cubic feet), and this rate was considered by local mine exporters as prohibitive. In view of the reduction recently made in the freight rate for valonia from Turkey to the United States on American ships, the mine owners were hopeful that a reduction of freight charges for emery might likewise be made.

The following shipments were made in the second quarter of 1946:

	Metric tons
Holland	1,250
Sweden	400
Other European countries	500
	2,150

Counselor of Embassy for Economic Affairs Edward B. Lawson, Ankara.

GRAPHITE

Brazil.—In 1945, Brazil exported 131,025 kilograms of graphite valued at 454,786 cruzeiros, compared with 198,548 kilograms valued at 1,008,218 cruzeiros in 1944.

The Companhia Nacional de Grafite, Ltda., has produced graphite for several years. At first a deposit in Sao Paulo was utilized, but in 1944 activities were transferred to a massive deposit of good-grade graphite near Itapecerica, Minas Gerais. By 1945 they had tunneled into the deposit for about 60 meters with graphite on all sides throughout the full length of the opening. It was said that the flotation mill, with a capacity of 48 tons per month averaging better than 85 percent carbon, could be expanded easily to produce 200 tons a month if there were a market for that quantity. In 4 months of 1944, 280 metric tons of 85-percent concentrates were produced. At that time some of the production was being sold in Argentina and some was consumed in the metallurgical industry in Brazil. The reserves are said to be important. Operators are actively cultivating the Brazilian market and are seeking a larger export market. It is not known what percentage of the output is crucible grade.
(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

Korea.—The only crystalline-graphite mine now in operation is the Orudong mine in Kyonggi-do. Present production

is approximately 2 tons of graphite concentrate (80 percent carbon content) per day.
(Summation Report No. 11, U. S. Army Military Government Activities in Korea, August 1946.)

TALC AND PYROPHYLLITE

Korea.—There are three talc mines and one talc mill near Chung-ju, Chungchong-pukto. The Sonman mine, the largest of these, yielded about 450 metric tons of talc per month under Japanese supervision but was idle during late 1945 and early 1946. About 1,350 tons is stock-piled near the mine. Available reserves are estimated at about 2,000,000 tons of good-quality talc. The Choson mine, also idle, exploits the same body of talc. It has near-by stocks of about 20 tons.

The Jon Hyon Chik talc mill could be placed in operation after a few minor repairs. Stock piles total about 49.5 tons of powdered and 608 tons of crude talc.

Pyrophyllite has been reported in 50 Korean localities, of which 27 are in the American zone. Twenty-two are in Kyongsang-namdo and five are in Chollanamdo. In 1944, Korea produced 41,211 metric tons of pagodite, a variety of pyrophyllite with 40,011 tons coming from South Korea. Nine of the South Korea mines were in operation.
(Summation Report No. 10, U. S. Army Military Government Activities in Korea, July 1946.)

MONAZITE

Brazil.—In the first half of 1946, 500 metric tons of monazite valued at 421, 650 cruzeiros ($US21,083), was shipped from Brazil.

Monazite occurs in Brazil chiefly in beach sands and to a smaller extent in river deposits in Minas Gerais. The beach deposits extend from the northern part of the State of Rio de Janeiro through Espirito Santo and into southern Baia.

The original matrixes of the minerals found in the beach sands are the archeozic granites and gneisses, in which monazite and other minerals are accessory in minute percentages.

The largest production has been from the beach at Guarapary in Espirito Santo. The relative quantities of the different minerals vary from place to place; north of Vitoria the sands are poorer in monazite. On a portion of the beach subject to tides and wave action the monazite sands are found at or near the surface; but in the dunes the richer strata may be at a depth of 3 meters and in exceptional instances at a depth of 7 meters. The workable strata are said to be about 1 meter thick.

Franklin Pardee reported in 1941 that the first washing was done at Guarapary on a large Overstrom table, which removes most of the silica. The concentrates were then dried, screened, and classified in an air jig before treatment in electro-magnetic separators. The plant then had a rated capacity of 150 tons of monazite per month. From October 1940 to September 1, 1941, the plant shipped 559 tons, which was sold at the plant for $US36 a ton. Monazite brought $US60, c.i.f. New York, at that time.
(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

The Mystery of Troublesome Brook

(Continued from page 116)

Shaft 22, on about one block north of the Falls, the writer does not know of any deposits, hereabouts, of sufficient size to contain a cave or opening large enough to have enabled a formation of this size, to grow. Nor has she seen any nearer than the famous Howe Caverns, just below Albany on the other side of the Hudson River.

If any of our readers have any suggestions on the matter the writer would be glad to hear from them and to show her specimen if they should care to call.

The other boys in the party were, Bob Whorlow and Bruce Parker, and Richard Waite and his father, Rupert Waite, all of Crestwood.

Common pebbles that are found along the beach of any body of water, when polished often show very pleasing designs and colors. Polish a few of them!

SEMIPRECIOUS STONES IN BRAZIL

(Bureau of Mines Mineral Trade Notes, Nov. 20, 1946)

At present, the production of semiprecious stones in Brazil is in excess of demand, although the European market has become active again. In the past few months the United States market has been dull; in some instances parcels of stones exported from Brazil have failed to find a market. Very high-grade stones are rare but obtainable at a premium above the general price level. The prices for calibrated stones for export have declined as much as one-third in the past 6 months.

A new discovery of amethyst at Campo Formosa in the State of Baia, north of Brejinho, the former chief amethyst-producing center, has depressed the price. Some current retail prices follow:

	Cruzeiros per carat
Amethyst	3 to 14
Citrines, good color	12
Tourmaline, dark green	20 to 40
Tourmaline, light green	90 to 180
White Beryl	Cr$6.50
Blue topaz	14
Golden beryl	50 and up

(The cruzeiro is considered as roughly equivalent to 5.3 cents U. S. cy.)

During World War II, gem-stone production in Brazil was affected in several ways. The volume of production was reduced by the diversion of labor to strategic-mineral production, such as quartz crystal and mica mining. In normal times there was a market for the inferior gem material in Germany, and it was said that the loss of this market for the low-grade material inevitably mined with that of good quality (and paid the expenses) caused much of the gem mining to be suspended. The miner usually is an independent worker who must have a daily income and can not finance himself until he encounters rare material of good quality.

Much more cutting of the stones was done in Brazil during the war than in prewar times and at relatively low prices —10 to 15 cents per carat; but the cost was still too high to permit use of the large volume of inferior rough that was formerly cut at Idar, Germany, and reexported.

The generally high prices for everything in Brazil were responsible for the high prices demanded for gem stones; aquamarine prices were several times higher than normal.

More gems come from Minas Gerais than from any other State. The pegmatite gem region lies roughly east of Belo Horizonte and extends north into the State of Baia, the worked deposits becoming sparser, perhaps because the population is thinner, toward the north.

Some of the centers of activity are Teofilo Ottoni, Governador Valadares, Salinas, Itabira, and Arassuahy. Their names give only a general indication of the locatilty. Many of the mines are some distance from the nearest town. The nature of specimens observed indicates that gems probably are quarried from solid rock in the region of Governador Valadares. It is apparent that elsewhere the gems come from soft, decomposed material or stream beds.

With the exception of fine quality amethyst, which seemed to be getting scarcer in 1944, it was believed that the potential supply of rough gem material was still large. On the other hand, it was observed that little gem material was disclosed in all the pegmatite mining for mica, tantalite, and beryl.

There was a strong demand for aquamarine in the war years, and a fair supply was available, although deep-colored stones were rare. Deep-blue large stones sold at wholesale for $US20 to $US30 per carat, and the retail prices were correspondingly greater. Only cheaper, paler material was being exported. Aquamarines are found associated with other beryl gems, such as pale morganite and golden beryl, throughout the range of the pegmatite zone. Emeralds, pale in color, found in several localities in Baia and Goiaz, were sold (in 1944) for about $US5 per carat. No stones com-

parable to Colombia emeralds have been seen.

Green tourmaline is common and inexpensive; much of it is too dark. Fine red rubellite is scarce and expensive. Very few of the stones were perfect enough to command a good price or to find a ready sale.

White and blue topaz are common in the pegmatite dikes and in stream-worn gravels. Fancy deep-colored stones command better prices than aquamarines.

Yellow topaz, called Imperial topaz in Brazil and precious topaz in the United States, is rarer than aquamarine, but the demand in 1944 had not yet been reflected in high prices.

Brown precious topaz occurs in the vicinity of Ouro Preto, Minas Gerais. Numerous small deposits have been worked, but the production is very small, and fine gems are uncommon. The best mine is said to be the Boa Vista near Rodrigo Silva.

Some of the stones sold as topaz are amethysts that have been heated in a bed of sand until the color has changed.

Citrine may be a natural stone, or one in which the color has been changed by heating or "burning" amethyst or smoky quartz. Natural citrine of a fine yellow color is found in Baia. It is also found near Anapolis, State of Goiaz, where the crystals are in alluvial gravels. These citrines are said to be splotchy in color, ranging from yellow to red. A popular grade of citrine is produced by heating amethyst from Rio Grande do Sul. Most of the citrine gems are from smoky quartz that has been heated to produce the desired colors, which range from light yellow to orange; a cognac color is considered the best. Evenly colored stones of many sizes can be produced. The amethysts of Xique-Xique, Baia, are successfully heat-treated to produce yellow citrine. The citrine market declined during the first part of 1945; possibly the material was oversold.

Amethysts are found in 5 States in Brazil: Rio Grande do Sul, Baia, Goiaz, Espirito Santo, and Minas Gerais; the mode of occurrence differs with the locality. In Rio Grande do Sul cavities are lined with quartz, which is sometimes amethystine. Amethyst in Minas Gerais and Espirito Santo, has an entirely different origin, as it is found in veins in pegmatite dikes. On the Rio Pardo and Rio Preto in Espirito Santo, large crystals are found loose in the soil. At the Brejinha mine in Baia, amethyst crystals line the cavities in a friable white sandstone. Waterworn pebbles of amethyst have been found which are derived from the erosion of a similar formation.

The most desirable amethysts are those that come from Brejinha, Baia, the best of which have a deep purple hue. The least desirable are the light-colored, large and uniformly tinted stones that are found as river-worn pebbles at Xique-Xique, Baia.

Other less common gems are interesting and valuable. Chrysoberyl found near Suassuhy, Minas Gerais, makes attractive lemon-yellow stones that sell from $US5 a carat up to 10-carats sizes, and 20 carat stones may command a price to $US10 to even $US40 a carat for exceptionally fine ones.

Andalusites seem to be relatively common near Sta. Maria do Suassuhy. Gem garnets have been produced near Salinas, but in 1945 better ones were reported occurring in Ceara. A small quantity of good-quality kunzite of a deep rose-lilac color was found at Cuite, near Governador Valadares, Minas Gerais. A new occurrence, said to be the first in Brazil, of milky white precious opal has been reported, with no mention of location.

Chrysoprase of an attractive light-green color occurs in veins an inch or more thick from the vicinity of Sao Jose do Tocantine, Goiaz; commercial gem-cutting of this material has not yet been developed.

Agate was being dyed black to supply the demand for black onyx.

The official statistics for exports from Brazil in 1944 and 1945 and the first 6 months of 1946, follow:

Stone	1944		1945		First half 1946	
	Grams	Value, $US	Grams	Value, $US	Grams	Value, $US
Agates	19,226	13,061	20,918	22,457		
Aquamarines	72,857	578,945	107,144	652,897	63,055	350,542
Amethysts	131,075	311,202	149,283	392,409	185,516	404,483
Garnets	32,177	93,490	80,354	255,026	43,622	109,642
Cat's eyes			121	9,204	270	12,028
Topaz	22,072	68,197	135,464	707,483	10,107	23,511
Tourmalines	9,592	42,888	19,950	78,277	4,824	27,317
Citrines (quartz)	137,565	272,923	131,923	275,940	93,351	137,428
Other semiprecious	59,037	96,846	750,210	570,327	557,515	312,525
	483,601	1,477,156	1,395,367	2,963,637	958,260	1,377,476

(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

HELICOPTER TO BE USED FOR MAGNETIC PROSPECTING

OTTAWA, ONT.,—Full-scale helicopter prospecting will get underway in Canada, the United States, Mexico and Venezuela this year as the result of experiments conducted with a Bell Aircraft Model 47 helicopter last summer in northern Ontario and Quebec, Hans T. Lundberg, vice-president of Lundberg-Ryan Air Explorations, Inc., of New York and Toronto, Ont., has revealed.

Speaking at the meeting of the Canadian Institute of Mining Engineers here, the internationally-known geophysicist, who has discovered valuable deposits of iron, lead, zinc, gold, nickel and other ores in Europe and North America, said that, as a result of the tests, his organization will take delivery this month on the first of two specially-modified Bell helicopters and will start work immediately.

"After many years of experimentation with airborne magnetometers using captive balloons, kites and airplanes," Lundberg told the engineers, "the best solution seemed to be the helicopter.

"Our aim has been to make magnetic surveys from the air that would closely duplicate the surveys made on the ground. The complete control of position with the helicopter makes this possible."

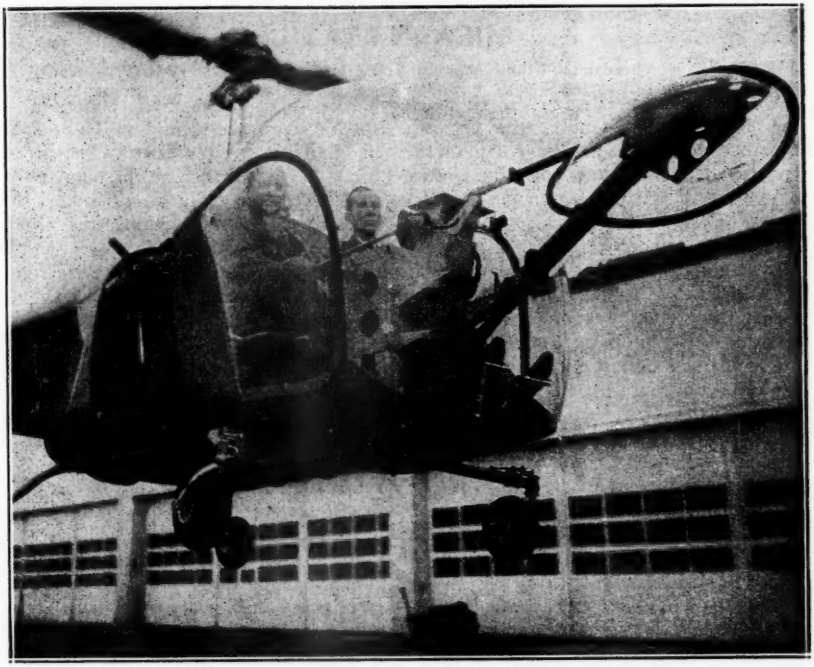
Maps and diagrams from the surveys in Ontario and Quebec proved that the results obtained from the helicopter-borne magnetometer closely coincided with the result obtained on the ground, he said.

Chief advantage of the helicopter, he pointed out, is time-saving qualities.

"A ground survey made in northern Quebec of an area 12,000 feet by 10,000 feet required about 70 days to prepare and to complete the magnetic operations utilizing the services of two engineers and two helpers," Lundberg explained. "Exactly the same area was surveyed by helicopter in one hour, using only an engineer-observer and a pilot."

With the helicopter, it was found, flights very close to the ground could be made with complete safety. In bare areas, the engineers learned, surveys were made 25 and 50 feet above the ground, while in forest areas the height was increased to 100 and 150 feet.

"The flown results," he said, "do not differ essentially from the results obtained in the ground survey. Even comparatively small features are identical. Only the most minute details are blotted out and, as must be expected, the total intensity values are slightly lower from the air.



Hans T. Lundberg, left, vice-president of Lundberg-Ryan Air Explorations, Inc., of New York and Toronto, Ont., takes a pre-delivery ride in the Model 47 helicopter his firm has purchased from Bell Aircraft Corp. Magnetic equipment designed to detect ore deposits from the air will be installed in the plastic teardrop in front of the cabin. The Lundberg-Ryan organization plans to use its helicopter in Canada, the United States, Mexico and Venezuela this year.

"With the helicopter, a predetermined position and altitude can be reached at any given moment. A given line laid out on the ground can be followed rigidly with the helicopter. It also is possible to ascend or descend vertically over a given point.

"This makes the correlation with ground features very easy, efficient, and accurate. By taking readings from two different altitudes, enough information is obtained to calculate the distance to the magnetic body as well as its depth."

The information obtained during the summer involved the use of experimental equipment installed in a helicopter leased from Bell, Lundberg told the engineers, "and we expect even better results from the automatically-stabilized and continuous-recording equipment installed in the specially modified Bell helicopter we will get this month."

Expansion of Non-Metallics Industries

Plans for the 1947 Mining Committee of the San Francisco Chamber of Commerce will be expanded to assure added attention to opportunities in the non-metallics field, according to an announcement on Friday, January 17, by Chamber President Carl J. Eastman.

On recommendation of the Chamber's 1946 Mining Committee, representatives of various non-metallics industries in northern California and Nevada will be added to the group. Determined efforts will be made to stimulate the production of non-metallic minerals in the areas adjacent to San Francisco for processing in Bay Region factories.

According to a report by the committee to President Eastman, opportunities abound for greater production of non-metallics minerals and their processing in this area.

MICA IN BRAZIL

(Bureau of Mines Mineral Trade Notes, Nov. 20, 1946)

Brazil.—During World War II, when the Indian mica supply was cut off, Brazilian mica became the chief source for the United States and the United Kingdom. The chief producing State is Minas Gerais, although some output comes from remote districts of Goiaz and Sao Paulo, and some from Baia. All mica produced is ruby muscovite, but green mica and phlogopite have been reported to occur in the State of Baia.

The Minas Gerais mica zone was organized into four districts by the U. S. Commercial Co.

Governador Valadares, extending some 190 kilometers from north to south and reaching a maximum width of 180 kilometers.

Espera Feliz, 100 kilometers from north to south and ranging up to 35 kilometers wide.

Muriae, 150 kilometers long, northeast-southwest, and ranging up to 70 kilometers wide.

Raul Soares, extending some 135 kilometers from northeast to southwest and up to 80 kilometers wide.

The center of the mica zone is about 250 miles due north by highway from Rio de Janeiro. The chief cities or towns in the area had good communication with Rio de Janeiro by rail as well as by improved or fairly good dirt roads, but many of the operations could be reached only by poor dirt roads or horseback trails almost impassable in the rainy season. About 500 mica- producing properties were operating in the area by the end of 1944, but 75 percent of the production came from about 60 of the larger properties. It was estimated that 12,000 persons were engaged in mining, transporting, trimming, and sorting mica.

Within these four districts the mica deposits occur as small, unusually irregular masses of mica-bearing pegmatites. Numerous productive deposits are grouped in a relatively small area at some places, as at Espera Feliz, but most of the deposits are widely scattered.

The mica pegmatites occur in all shapes, sizes, and attitudes. Those found in quartzite, notably at the Cruzeiro and Serra Negra mines, have the tabular form that merits the designation "dike." The majority of known pegmatites are associated with schists or gneisses, and although dike or sill-like forms are found, the bodies usually are so irregular that no single descriptive term can give a clear idea of their shape. They are likely to change direction abruptly, or to swell, pinch, feather out, or terminate within a few feet in any direction. In length they range from less than a meter up to a kilometer or more, and in width they range from a few centimeters to 40 or 50 meters.

In some pegmatites, particularly those with a low feldspar content, the mica zones may be directly at the contact of pegmatite and wall rock. In others where the center is occupied by a more or less continuous core of massive quartz, two mica zones may parallel the walls at some distance from them. Some pegmatites, particularly those in the Espera Feliz area, yield a mica of commercial size from irregularly distributed pockets which do not appear to be related to mica zones.

In the mica zones themselves there is seldom a continuous band of workable mica. The mica is characteristically found distributed erratically in a series of pockets separated by extensive barren zones. If the pockets have a considerable extent in the plane of the mica zone, they are commonly referred to as mica shoots.

In some instances the positions of these shoots can be correlated with irregularities in the walls of the pegmatites, such as projections of the wall rock or changes in the direction of the contact.

In many pegmatites, particularly the narrow ones, mica that is too small to be commercial is rather evenly distributed throughout the pegmatite. Many of the barren pegmatites have very promising

appearance, but the conditions necessary for sheet-mica formation were lacking.

The location of a pegmatite possessing a massive quartz core is usually marked by a bold outcrop of white quartz. Where the quartz core is absent, there is seldm a topographic indication of the presence of a pegmatite, as the feldspatic portions weather at about the same rate as the schist country rock. The uncored pegmatite, unless they have been exposed by special conditions, such as a landslide, usually are hidden under a cover of red soil derived from the weathered schist. In such instances, the only surface indication of their existence is the quartz and mica fragments found in the soil on the slope below the hidden deposit.

From the foregoing it is evident that the probable value of most pegmatite deposits cannot be determined by sampling and development. Because the ore body is often unpredicatable, it is difficult to plan the method of mining to be used. A tally of fifty of the active mica mines in Minas Gerais at the end of 1944 indicated that three methods were in vogue. The open-cut method was used at 8 mines, the open-cut and underground combined method was used at 18 mines; and underground mining at 24.

Bulldozers rented to the mine owners by the U. S. Commercial Co. have been used to remove overburden from the larger pegmatites; in other instances the overburden was removed by hand. Only where mining was supervised or guided by American engineers was a shaft used to gain access to the mica.

The usual Brazilian procedure is to trace the float mica on the hillside up to the point of disappearance, then dig into the hill until the pegmatite is found. If the pegmatite appears to carry enough mica for commecrcial development, the first cut is expanded along the hillside. When the overburden to be removed becomes too heavy, a few tunnels may be driven into the deposit; but usually they become small, crooked, and ineffective.

No power was available at the mines, as only hand tools and wheelbarrows were used formerly. With the advent of the U.S.C.C., bulldozers for removal of overburden and portable compressors and jackhammers for drilling were rented. This equipment, in addition to mining methods introduced by the U.S. C.C. engineers, increased the output of the better class of mines where used.

As it is the nature of pegmatites to be small, the life of a mine is short, usually from a few months to a few years if mined actively. Therefore, portable equipment is the only desirable kind; mechanized mica mining must be based on the working of several pegmatites, if operations are to be continued over a considerable period.

In the region north of the town of Governador Valadares, an important part of the U. S. Commercial Co.'s work was building and maintaining roads, bridges, and culverts to provide access to the mines for food and supplies and to furnish a means of bringing out the mica. Other districts also required access roads.

It was authoritatively stated in 1945 that despite heavy production of mica in 1944, there were greater known probable reserves than a year before. This was explained by the activity in voluntary prospecting and development carried out during the year.

Costs of mica production are not available, but the factors that affect the costs of mining are known. No power is used, and little or no explosive; the mines are not equipped beyond picks; shovels, hoes, and wheelbarrows. Under favorable conditions in soft pegmatite, as much as 1.3 metric tons could be mined per manshift. Where the U.S.C.C. rented tractors, compressors, trucks, and similar equipment, the rent was cheaper for the miner than the cost of owning the equipment would have been. Moreover, it is difficult to state the unit value of the material mined. No large mines have been developed. An output of 40 tons per month of run-of-mine mica was considered very high. It would be necessary to mine 150 tons of pegmatite daily with an average content of 25 kilos per cubic meter of rock to produce 40 tons per month. According to the 1944 bonus

.. *(Continued on page 130)* ..

The Amateur Lapidary

MOUNTING A CABOCHON COLLECTION

BY LUCILLE SANGER

Although the hobby of collecting rocks is still in its infancy, most collectors who have been at it for three or four years have probably decided on their preference. This choice may have been influenced by the home environment. Fossils and cabinet pieces need cabinets and cabinets need room. A small apartment can soon become crowded with a prolific collector in the house so the choice of items collected may depend upon the dwelling of the collector. The material to be collected in the surrounding area may also influence the choice.

Most collectors cut their rocks into beautiful cabochons. They get a great deal of pleasure out of selecting a pattern and cutting the stone and putting a high finish on it, although it is doubtful if they get more pleasure from this than from showing the stones to admiring friends and envious rockhounds.

One rock cutter of our acquaintance deprecates the fact that many people cut cabochons just to be cutting, ". . . and when you are finished what have you got?" he indignantly demands. His idea of cutting stones is to make them up into jewelry so that they will be useful. He then puts the jewelry into a Riker mount to be shown to friends—but worn? Perish the thought! No one detests more than this writer, seeing things made just for the sake of the things themselves, just because they are handmade. The number of such articles, without beauty and of questionable utility, turned out each year by industrious but misguided people is legion. We do not think lapidary work falls into this category. It has to be a poor stone with a poor cut indeed to merit the ash can. A cabochon collection takes welcome precedent over the expression in water color or oils of the confused minds of modern artists. A colorful cabochon will be as beautiful a hundred years from now as it is today. Cutting stones developes latent talent in the amateur, and unlike paintings, cabochons are accessible to quite poor people. Properly mounted, they can be hung on the wall singly or in groups, taking the place of pictures. Or they can be stored in their cases to be shown as occasion arises.

The most common way of mounting cabochons is to buy Riker mounts. These are cardboard boxes, finished in black, with a layer of cotton in the bottom and a glass top in the lid. Some collectors keep a record of the material, localities, etc. on the back of the box. Others keep it in their heads. Others have a record book for that purpose. Riker mounts are far from being a satisfactory way of preserving cabochons. The stones slide around over the cotton unless the box is held perfectly flat. If the stones are presssed well into the cotton so that they remain stationary, only the very top can be seen. Another drawback of the Riker mount is that it is only cardboard, and while it will last years, the holes where the pins are located in the sides to hold the lid in place, become enlarged and the top is loosened. However, they do have the advantage of coming in various sizes.

In looking around for substitutes for Riker mounts, we wanted something strong to withstand a great deal of handling, also a container of uniform size which would stack well. We found that the wooden boxes in which cream cheese comes are ideal. Also they are to be had for the asking at any food store, as most grocers like to oblige a customer in this respect even though he might think the customer needs the advice of a psychiatrist.

Nail the bottom and sides more securely. Cut a piece of glass to fit the top, covering the edges of the wood. Cut a

piece of white coated cardboard to fit the bottom and glue it down with a few spots of glue. The cardboard can be Bristol board from an Art supply store or it can be the cardboard which the laundry puts in the shirts. Arrange the stones in a pleasing pattern and glue them down and affix the labels. Go over the stones lightly with a piece of cotton dipped in alcohol to remove fingerprints. Clean the inside of the glass with window cleaner or alcohol.

Cut four pieces of two-inch wide brown adhesive paper, about two inches long. Place the glass carefully on top of the box. Wet the tapes and place on each side of the box, being very careful to put it only about an eighth of an inch over the glass. These will hold the glass secure while the sides are being bound. Cut two pieces which will go around the end and a little more than half-way down the sides. Wet one piece and place the edge of the paper about a quarter of an inch over the glass at one end only. Press the side and bottom down securely. Before bending the paper around the end of the box, snip it at the corners, both top and bottom, then glue it onto the glass at the sides of the box. Press the sides down and then fold the paper over the bottom. This makes a neat cover for the whole end of the box. Repeat at the other end. The pieces of tape should lap a trifle in the middle, or they can meet exactly in the middle.

It was suggested that gilt paint be used to cover the wood on the inside of the box but the natural tint of the wood blends very well with the brown tape. If it is desired to paint the sides of the box, only a flat white paint should be used as there is no other color which so complements and brings out the beauty of gemstones. Very recently, to our delight, we found a larger size cream cheese box so that two practical sizes are available.

For glue, Testor's cement holds well and Le Pages's plastic cement is good. This writer has not yet tried Canada balsam but it should be good for mounting clear stones to the cardboard. It is not advisable to use ordinary mucilage as the stones are liable to come loose after the box is sealed.

These boxes can be displayed in three different ways. If it is desired to hang them on the wall, this may be done by using screw eyes. Place them two or three inches down from the top. Add a piece of wood the same height at the bottom so that the box will hang flat against the wall. The screws and wood may be painted or gilded.

They may also be hung on the wall by glueing and nailing a piece of wood at the top and bottom of each box. The piece of wood at the bottom causes the box to lie flat against the wall. If this method is used, then it is advisable to replace the thin bottom of the box with a stronger piece of wood, or put a stronger piece over the original bottom. Put two nails in the wall to hold the box and make grooves in the wood strip at the top of the box. Fit the grooves over

Back view of cheese box.

Side view

FIG. 1

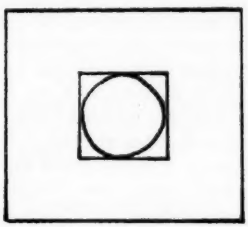


FIG. 2
Picture frame

the nails and the box is firmly held in place. See Figure 1.

Another method of display would be to have a panel of several rows of boxes on a wall, the panel being made of wooden strips with grooves to permit the boxes to be inserted at the top, one above the other, with a similar row or two boxes adjacent to the first.

A third way is simply to stack the boxes on a shelf or in a drawer where they are readily available to show to friends with the aid of a card table and bridge lamp.

Another interesting way is to mount the gems in old strong picture frames to be found in nearly every attic. Those portraits of ancient relatives can be replaced with something useful and beautiful. Ten cent stores are also a good source for frames, or was before the war. They save cutting glass to fit and the pictures can be discarded. Second-hand stores and antique places, although the latter will undoubtedly be expensive, are also a good source of supply.

The objection to using picture frames is that the space between the glass and the back is to narrow for the stones. A deeper frame, such as those used for old Victorian flower pieces is desirable. It is necessary to remodel the frames and this can be done by nailing four strips of wood to the back of the frame just next to the glass. If the picture is a square one, the strips merely outline the glass, but if the picture is round or oval, then a square or rectangle is formed around the glass. This increases the depth of the picture, the width of the strips of wood adding the space needed. Cut a wooden back to fit the four strips. Cut a white coated piece of cardboard and glue it to the wooden back. Remove the glass and place the open frame on the cardboard. Draw around lightly with a hard pencil (so it can be erased later) the enclosure where the stones are to be mounted. Replace and clean the inside of the glass. Glue stones to cardboard, and after they are thoroughly dry, lay the back of the picture on the four strips and nail down.

The oval and round frames require an additional fitting, so before putting the back onto the frame, cut strips of white cardboard to fit inside the frame around the glass, and just the height of the tops of the strips. This forms a collar which holds the back in place so that it will not sag against the glass. The cardboard collar can be fastened together on the outside with a piece of scotch tape or brown paper tape.

These frames can be hung in the usual manner of hanging pictures, either from moldings or by hanging on a nail. However, it is better to use two nails as it will insure better hanging, and nail a strip of wood, the same sizes as the strips around the glass, to the bottom of the frame, but out of sight. This will make the frame hang flat to the wall. Keep the wire short so that the wall nails are completely covered by the frame. See Figure 2.

Mica in Brazil

(Continued from page 127)

prices, mica from Palmital mine was computed to have an average value of $US9.16 per ton of rock mined; that from Pedro Espirito mines was estimated to average $U6.25 a ton of pegmatite; and that from Rochedo mine was about $US28 per ton. (The last named is an exceptionally high unit value.)

Much of the mica is lost during preparation. For 50 mines, the quantity of strategic mica recovered in 1944 was 2,62 percent of the total run-of-mine mica, and other marketable mica was equal in weight to the strategic grades. Therefore, the final product was 5.24 percent by weight of the run-of-mine mica.

(Minerals Attache Emerson I. Brown, Rio de Janeiro.)

Club and Society Notes

New York Mineralogical Club

American Museum of Natural History, New York, N. Y., Wednesday, Dec. 18, 1946.

The meeting was called to order at 8:00 P. M. Dr. Pough spoke for a few minutes on change in color of gems produced by X-rays from a new, more powerful tube with which results can be obtained in five minutes that would take several hours with the older tubes. The colors thus produced will fade when the gem is exposed to sunlight and jewelers will have to be on their guard when buying gems to be sure the color is natural. He also described an experiment in which kunzite, a sapphire and a diamond were exposed to the radiations of an atomic bomb at Bikini. As far as could be determined, the stones were not affected.

The principal speaker of the evening was Dr. Charles R. Toothaker who spoke on "Recent Developments in Economic Mineralogy." Dr. Toothaker was early associated with A. E. Foote, mineral dealer of Philadelphia, where he handled many specimens of all kinds. These mineralogists were familiar with the associations and the localities of minerals containing elements which at that time were considered rare and of no economic importance. However as uses for these elements were discovered there was a demand for them in quantity and manufacturers had to rely on mineralogists either to supply them from known localities or to find new occurrences. These men who had studied what seemed like useless things, now are recognized to have made a very real and important contribution to bettering our way of living.

Some of the elements which have become increasingly important in the last forty years are molybdenum, magnesium, zirconium, titanium, boron, lithium, barium, and many others.

Mr. Gaines described a trip in Colombia, South America, where he arranged for a supervised visit to Muso, the famous emerald mines, where he collected some emeralds, parisite, codazzite, quartz, fluorite, and barite. At another locality in northern Colombia he collected autunite and phosphuranylite.

Mr. and Mrs. Marcin spent several days in Virginia at Amelia and Irish Creek where they did some excellent collecting. Some of the minerals collected were cassiterite, amazonite, albite, microlite, purple apatite and a crystal of manganotantalite about 3 inches in diameter. They stopped at French Creek, Pa., on the way back and reported that the locality was well worth while visiting.

Mr. Lisle exhibited specimens of dolomite in a variety of colors from the Mirabel Mine, Calif.

Mr. Yedlin visited the New Street Quarry, Paterson, N. J., where he collected analcite, stilbite, apophyllite, pectolite, thomsonite, datolite and prehnite.

Dr. Stenbuck displayed specimens of obsidian "Apache's Tears" for distribution to members.

Meeting of January 15, 1947

The meeting was called to order at 8:00 P. M. The treasurer's report was posted so that all members could examine it. Dr. Pough reported that Smith's—*Identification and Qualitative Chemical Analysis of Minerals* is a very good book particularly useful for the amateur and collector. It contains excellent color plates of bead tests and tests on plaster and charcoal blocks. Dr. Holmes, however, reported that the printing job in some of the books was not too good and the plates were blurred.

The principal speaker of the evening was Dr. Edgar T. Wherry who spoke on "Searching for Radioactive Minerals in Pennsylvania." Dr. Wherry has been interested in radioactive minerals since they were first talked about and repeated many of the early experiments of exposing a covered photographic plate to radioactive minerals. He found that there were quite a few radioactive minerals in Pennsylvania, mostly in southeastern Penn., but none of them in large amounts. Some of these minerals were autunite, torbernite, euxenite, allanite and cyrtolite.

However a large deposit of carnotite was found at Mauch Chunk where the mineral is scattered through a coarse sandstone. It is believed that plants concentrated the elements of this mineral and on their death released them and the mineral accumulated in the rock.

The discovery of radio-activity led to intensive study of atomic structure of which the latest development is the obtaining of energy from atomic fission.

Purfield Kent, Secretary

Mineralogical Society of Arizona

Two meetings of the Society were held during January, 1947, in the Mineral Bldg., State Fair Grounds, Phoenix, Ariz.

On Jan. 2nd, the program consisted of the motion picture "Minerals of Texas," courtesy of U. S. Bureau of Mines.

On Jan. 16th, the program consisted of "What the Rockhounds wants to know", by Chas. A. Diehl and Ben Humphreys.

Mineralogical Society of So California

Mr. H. Stanton Hill, Instructor in Geology and Mineralogy at Pasadena Junior College, spoke on the "Geology of Lassen Volcanic National Park" at the January meeting of the Mineralogical Society of Southern California. He illustrated his lecture with beautiful Kodachrome slides taken this last summer while he was vacationing in the area.

Mr. Hill stated that of the some five hundred active volcanoes in the world, we can claim only one. Lassen Peak, and it is dorment now. Most volcanoes are found around the margins of the Pacific Ocean, this belt being also the active seismic region of the world and the area of youthful mountains. The southernmost peak of the Cascades, Mt. Lassen, owes its distinction to the 1914-15 series of irruptions.

The dome shape of the 10,453 foot peak of Lassen is typical. At the base of Lassen to the north lie Chaos Crags, a good example of a plugged dome which results from the pushing up and squeezing out of lava. A shattering explosion here caused a feature with no parallel in North America. This explosion caused an avalanch of material which spread out and covered an area of 2½ square miles. The material probably moved at the rate of 50 miles per hour. In the Chaos Jungles the trees are stunted and rocks are piled up against Table Mountain for 400 feet. The margins of the Jungle are very sharp, sometimes being 100 feet high. Studies of the trees indicate that this blast could have occurred about 200 years ago.

On the northeast side of Lassen on May 30, 1914, occurred the first irruption. It irrupted when the snows were melting and with no warning. The 1914 activity was mild. May 16-18th a glowing was noticed. May 19th a 1,000 foot tongue of lava caused mud flows. On the north side of the mountain a second tongue of lava coming out over the heavier snows on this side and melting them caused tremendous mud flows which came down in two creeks. Loomis, on May 22nd, took pictures just after the mud flows. His pictures show the tongue of lava on the north side which was blasted away that night. That horizontal blast blew down trees which thirty years later are still lying parallel in a vast devastated area—along with huge boulders which were either blown there or were carried down on the mud flows.

On the south side of Lassen spines stick out of a huge mass of talus. These spines indicate that Lassen was a plugged dome and may represent individual actions of lava. The spines are glassy and slightly convex, thought to be the original shape of the spines polished by friction as they were pushed up. There are three craters on Lassen.

Brokeoff Mountain is another interesting feature of the Park. It was formed when the crater and upper parts of an old volcano were destroyed. Another interesting point is Bumpass Hell where hot gasses still escaping keep rocks soft and easily eroded. These gasses alter the andesite breaking down the feldspars first changing them to a clay—kaolinite. Sulfur, halotrichite, opal, solfatarized andesite and microscopic pyrite crystals in mud are found. The hot springs in this region are connected with the rainfall of the area. In the center of the old Coldara are the Sulfur Works where the best sulfur is found but this is on private property.

In the northeast corner of the Park is Cinder Cone, a beautiful 600 foot high cone with a double crater. Lava flows here are unusual and not very old, the oldest being 500 years. The Cinder Cone is younger than the oldest flows since ash covers some of the flows. This lava is unusual in that it is a quartz basalt. Since basalt does not contain quartz it is thought that the quartz here was not originally here but came from an isolated quartz area and mixed with the basalt as it was pushed up. In 1851 occurred the latest flow which came from the bottom of the Cinder Cone and damned up the stream forming Snag Lake. Diatomaceous earth, which can be collected along the margin of the quartz basalt flow, indicates the presence of an old lake. Subway Cave, an interesting feature here, is formed as a tube when lava continued to flow out from under a cooled crust.

It is thought that Lassen being a plugged dome could have formed very quickly, perhaps even in five years and maybe not more than 5,000 years ago. There are several observatories at Lassen and scientific studies are continually being made which show that there is still considerable action taking place in this most interesting region.

Pauline A. Saylor
2444 E. Bonita Ave.
Covina, Calif.

Colorado Mineral Society

A regular meeting of the Society was held on Jan. 3, 1947, in the Colorado Museum of Natural History, Denver, Colo. The program consisted of a Mineral Identification Symposium.

Buffalo Museum of Science
(Gem and Mineral Section)

A regular meeting of the Section was held on Nov. 20, 1946, at the Buffalo Museum of Science, Buffalo, N. Y. The feature of the meeting was a lecture on "The Art of Gem Cutting", by G. Grant Waite, of Toronto, Canada.

Mr. Waite, a member of the R.&M.A., is an international figure in amateur gem cutting circles and has written extensively on the subject; he gave a very interesting and inspiring talk to about 50 members and their friends. Unfortunately he could not bring more than 2,000 faceted cut gems on account of the difficulty of getting them back and forth through the customs.

Los Angeles Mineralogical Society

Mr. Victor Hayek, Secretary of the Southwest Mining Association, discussed the mineral resources of America at the January meeting of the Los Angeles Mineralogical Society. According to published Statistics of the Bureau of Mines and other government agencies, many of our metal resources will last but a few more years. Copper was listed to last but 34 years at present peacetime consumption, nickel, chromite, tungsten, etc., from 1 to 12 years. Iron ore was given the longest span of 111 years. Mr. Hayek's contention was that these reports did not give a true picture of our resources as during war years the mines had an enormous production job to handle and no new developments could be made and no new ore bodies were developed. He gave one good example to support his contention, namely, the State of Arizona is practically all of volcanic origin, whereas only about 3% of the surface has been worked and prospected.

With modern methods and Scientific tools, the prospector will probably continue to uncover many new ore bodies. Then again Scientific developments will enable the smelter to rework old diggings of ore formerly considered uneconomic to work. Formerly an 8% copper ore was the minimum required where as now a .75% ore can be worked. Mr. Hayek stated that 55% of the metals produced come from 11 western states.

On Sunday, Jan. 20th, 1947, about 55 members and guests motored up to Mojave and visited a quartz crystal deposit where many fine specimens were obtained.

A. G. Weigel, Pub. Chm.
Los Angeles, Calif.

Chicago Rocks and Minerals Society

The Chicago Rocks and Minerals Society held the first meeting of the year at Sauganash Field House, Chicago, Ill. The speaker of the evening was Vida Latham, MD, DDS. Her subject was "Diatoms."

Dr. Latham is a prominent member of the Illinois State Microscopical Society which she helped organize. She was also one of the organizers of the Chicago Academy of Sciences and author of several medical textbooks.

She came to the meeting armed with four different types of microscopes, a large and choice collection of micro-photographs of diatoms, some bottles of different colored diatomaceous earth, and best of all, some of her most valuable and irreplaceable slides showing different forms of diatoms.

Dr. Latham spoke fluently from a vast knowledge gleaned through years of research on her subject. The audience enjoyed every moment of it and the question period which followed. All were amazed to learn of the great number of commercial uses of diatoms.

George C. Anderson, President

Mineralogical Club of Hartford

A regular meeting of the Club was held on Jan. 8, 1947, at 249 High St., Hartford, Conn. The subject was "Gems and Gem Stones" and the speaker, Orlando Paddock.

Pacific Mineral Society

A regular meeting of the Society was held on Jan. 10, 1947, at Scully's Restaurant, Los Angeles, Calif. The speaker was James F. Underwood whose subject was "Collecting minerals in Oklahoma and Arkansas."

North Country Mineralogical Club

A new mineral club has been formed in northern New York under the name of North Country Mineralogical Club with 45 members. A number of others have expressed interest and will probably join. One preliminary meeting was held in Keeseville, with 10 people present, and another in Plattsburg, in December with about 20 attending. The Club was formerly organized in Plattsburg on Jan. 9, 1947.

At least three members of our group are members of the Rocks and Minerals Association: Miss Rose Burnham, Keeseville; Mr. Arthur Sandiford, Ellenburg Depot (at present on the faculty of Champlain College in Plattsburg); and Mr. William R. Ellsbury, Keeseville, President of our new Club.

Miss Gertrude E. Cone, Sec,
Keeseville, N. Y.

Minnesota Mineral Club

A regular meeting of the Club was held on Feb. 8, 1947, at 8 p.m., in the Curtis Hotel, Minneapolis, Minn. The program was devoted to the quartz family minerals, also the showing of colored pictures of the Chicago Museum, Hall of Gems, and the J. P. Morgan Collection.

Joliet Mineralorist Society

The Joliet Mineralorist Society and the Joliet Astronomical Society, both of Joliet, Ill., released in January, 1947, the *Meteorite*, a publication which is to come out monthly and represent both groups. The Societies meet at the Joliet Township High School and Junior College. The entire program of the January 6th meeting was devoted to the inauguration of the new monthly bulletin. Mr. Louis Knowlton, a member of the R.&M.A., is President of the Joliet Mineralorist Society.

Rochester Academy of Science (Mineralogical Section)

A regular meeting of the Section was held on Feb. 13, 1947, at 8 p.m., at the Rochester Academy of Science, Rochester, N. Y. The program was devoted to "Tourmaline and its varieties", by Charles W. Foster. Many interesting facts about this, one of the most interesting minerals, were discussed.

Pomona Valley Mineral Club

The regular meeting of the Club was held January 14, 1947, in the Chemistry Building of Pomona College—Claremont, Calif. The Club continues to enioy a marked increase in members and guests. After a short business meeting—Mrs. Hollis B. Pafe, Club member —read a poem on "THE MYSTERY OF MONTHS" which very cleverly named the gemstone for each month and revealed it's significance. She spoke on "GARNETS AND THEIR VARIETIES"—displaying a representative collection, including some which she collected near Wrangell, Alaska.

Mr. Russell D. Dysart—Instructor of Geology at Chaffey Junior College, Ontario—was the guest speaker for the evening. His subject "HIGHLIGHTS OF WESTERN GEOLOGY" was illustrated with many fine kodachrome slides which depicted the most interesting geological and glaciated areas of our Western National Parks.

A vote of thanks was tendered Mr. Dysart at the conclusion of the pictures.

Mr. Ernest W. Coiner—member of Pomona Valley Mineral Club and a recent member of The Old Timer's Club—passed away in Pomona December 21. He had been in ill health for several months. Over many active years, prior to his illness, he had collected minerals and was an accomplished lapidist. He a very genial personality and shall be greatly missed by fellow Club members.

Edythe M. Thompson
Pub. Chm.

Junior Mineral Exchange

The Exchange is now three years old. It was formed in January, 1944, by Jerome Eisenberg, George Meyers, and Arnold Hampson. Starting with 5 members it has grown in size to a club with over 55 members in 16 different states. Membership is open to anyone from 13 to 17 years of age. There are no dues. To join, send your name, address, age, and size of collection to the secretary, Jerome Eisenberg, 77 Victoria St., Revere 51, Mass.

New Jersey Mineralogical Society

A regular meeting of the Society was held in Jan. 7, 1947, at 8 p.m., in the Public Library, Plainfield, N. J.

The speaker was John H. Waddell, of the technical staff of the Bell Telephone Laboratories, whose subject was "Kodachrome Sound Motion Pictures of Bikini Atom Bomb Test."

Mr. Waddell was photographic technical adviser to the Joint Task Forces sent to Kwajalein and Bikini Atom Bomb tests. The pictures of this historic event were official government released pictures and were not only examples of unusual photography but were also awe inspiring in their beauty.

Mineralogical Society of Southern Nevada

The 'Rock Hounds" of Southern Nevada met Dec. 17th., 1946, in the Br. of Water and Power Bldg., Boulder City, with president, Mr. Paul Mercer, presiding.

The main feature of the business meeting was a fluorescent display by Mr. Mercer. This interesting phase of rock collecting was enjoyed as the unusual colors which some minerals show under a lamp are very beautiful.

More discussion was given to suitability of various types of lapidary equipment. Keen interest in this was aroused by a display of about 50 finished cabochons which was shown by Mr. J. Redding of Henderson. Among other items in the display were a bracelet of Utah banded and flowered agate, a necklace of turquoise and a broach of chrysocolla. The work on the jewelry was delicately and beautifully done.

Three door prizes, consisting of mineral specimens were presented the Society for the meeting by Mr. Hickey, Sr., Secretary of the Los Angeles Mineralogical Society. These were won by Mr. Malcolm, of Henderson, Mrs. Julian and Mr. D. McMillan of Boulder City.

The members voted against more field trips until after the holidays.

At the conclusion of the meeting the group adjourned to the Green Hut Cafe for the Christmas "grabbag" and refreshments. All members and guests received nice specimens of gem-stones and minerals.

Mr. and Mrs. R. MacNeil of Henderson joined the ranks as members, while Mrs. J. Redding and Mr. and Mrs. Malom, all of Henderson, were guests of the evening.

Florence McMillan Sec.

The Los Angeles Lapidary Society

The Los Angeles Lapidary Society started the New Year with a new president. John E. Gaston took over the office, as Benton MacLellan, elected last year, left for Manila, P. I., for an indefinate time. A "going away" party in honor of Mr. MacLellan was attended by the Board of Directors, at the home of Louis and Katherine Goss.

The January meeting was held at Griffith Park Play ground Auditorium. A very interesting program was presented by the "Faceteers," an inner group specializing in faceting.

Charles J. Norona an associate whose hobby is color photography, took pictures of individual specimens at our last public exhibit. These were shown on the screen at the December meeting and received a great deal of favorable comment.

Jessie Quane, program chairman, held "open house" at her home in Altadena, Calif., Dec. 28 and 29.

Chuckawalla Springs will be the location for the January field trip. Agates, nodules and geodes may be found in abundance.

E. Grace Peters,
(pub. chairman)

The Tacoma Agate Club

New officers of Tacoma Agate Club are:
President—Mrs. Fred Reiter
Vice Pres.—Mr. Nels Olson
Secretary—Mr. Don Ross
Treasurer—Mr. Clarence Hopkins
Directors—Mr. Leo Wadsworth
Mr. Roy Inerdian
Mr. William Gaalloway

Meetings are held the first and third Thursdays of the month at the Y.M.C.A., Tacoma, Washington, at 8 p.m. and the Club is sponsering a series of lectures by Mr. Fred A. McMillin.

Mrs. Juanita Savisky
Publicity Chairman

COLLINS HILL (PORTLAND, CONN.) DESERTED

BY RICHARD SCHOONER
22 Colchester Avenue
East Hampton, Conn.

As some collectors undoubtedly know, the Collins Hill locality is completely inactive with the Strickland Feldspar Quarry submerged in a veritable sea of bluish-green water and the Schoonmaker Mica Mine looking as though it had been deserted for a decade! All of the buildings are still standing and locked at the latter working, but the vicinity of the Strickland has surrendered everything that could possibly aid in relieving the lumber shortage. The big dump still provides some interesting minerals, but these are naturally of the rarer less colorful, and more readily overlooked species. I have had my best luck in finding the relatively uncommon phosphates of the lithiophilite series of alteration products. In addition to these I have also found several specimens containing crystallized uraninite with an occasional incrustation of reddish-orange gummite. Among other items of interest from Collins Hill are: a specimen of marcasite in minute crystals of typical form (in a cavity of massive quartz); some very small crystals of transparent blue apatite; a very small cavity in albite (associated with crudely crystallized columbite) containing several velvety, blackish-brown crystals in parallel position; some good specimens of pyrrhotite in massive light smoky quartz; a small modified cube of clear golden fluorite containing a purple phantom; some nice crystals of cyanite (in biotite schist) from the metamorphic contact just to the east of the commercial operations; and a quantity of showy diopside, grossularite, chlorite, and hornblende from the other contact zone—on the opposite side of the hill in the bed of Carr Brook. In addition to these meager odds and ends, I also found some beautiful asbestiform tourmaline (in small specimens, alas!) associated with the even more beautiful capillary crystals. These minerals—there was also some pale green crystallized fluorite—occurred in an albitic vein some six or eight feet in width on a narrow ledge just above the rising water, making collecting altogther too dangerous at the time and impossible when I again visited the spot a few week later. I now have a few specimens of the asbestiform material as well as the one good piece containing an incrustation of olive-green hairs, in a cotton-filled box, but if the spot were again accessible I am sure that a very large amount of the material would be found.

I have concentrated the greater part of my explorations in recent months on the old cobalt mines at the foot of Great Hill in the westernmost area of this town and I have found an overgrown dump which has afforded some very good specimens of arsenopyrite, scorodite, and associated minerals in addition to a little heminorphite (of poor quality) occurring as an alteration of sphalerite. A little mica-beryl quarry nearby, has furnished some small crystals of muscovite-pseudomorphous after cordierite-and a couple of specimens of crystallized marcasite and annabergite: In short, everything but those elusive cobalt ores!!!

WITH OUR DEALERS

An interesting rainbow assortment is featured by Mission Mineral Mart, of San Diego, Calif.

The H. E. Powell Co., of Little Rock, Ark., has an interesting suite of quartz xls.

More minerals for all in 1947 is a forecast of the Erskine Collection, of La Jolla, Calif.

Maricopa Gem & Mineral Mart (H. C. Mick, prop.), of Morristown, Ariz., can supply a nice bargain assortment.

Mineral specimens, cut stones, and genuine Indian silver are specialties of the Hermosa Gem & Mineral Shop, of Durango, Colo.

The Pan-American Mining Co., of Bayfield, Colo., is still featuring some of its very fine gem agate.

Have you a Coloradoite? Harrison S. Cobb, of Boulder, Colo., has it in stock.

In addition to fine cabinet specimens, Fred Roberts Jr., of Monterey Park, Calif., can render complete mechanical service to collectors and lapidaries.

A new advertiser is Guild, of Franklin Park, Ill., who can furnish silicon carbide grinding wheels.

Kathleen, the talented daughter of Frank Duncan, of Terlingua, Texas, is back again with her father after another siege in the hospital. She has regained her good health.

O. Ivan Lee, of New York City, has some old time and scarce rough precious and semi-precious stones for cutters.

Another new advertiser is Neavin Products, of Los Angeles, Calif., whose specialty is black onyx.

Still another new advertiser is Louis A. Sauers, a prospector and rockhound of Happy Camp, Calif.

Gemarts, of San Diego, Calif., announce a recent purchase of an entire private collection.

This month's special is opalized wood!—The Western Trader, of Sacramento, Calif.

Lapidary supplies are featured this month by A. J. Alessi, of Lombard, Ill.

A new lapidary supply house has been opened in the East. It is the Westfield Lapidary & Supply Co., of Westfield, N. J.

And another new advertiser is the El Paso Rock & Lapidary Supply, of El Paso, Texas, who also cater to the cutting profession.

Note the ad of Romart Gem & Mining Co., of Barstow, Calif.

A new Chicago shop by Arch Nisbet should please our many readers in that great city. Nisbet is a new advertiser.

Note:—Chuck Jordan, formerly of Sepulveda, Calif., is now located in El Monte, Calif. See his two new ads.

Allan Branham, of Lander, Wyo., specializes in jade but he has many other fine cutting materials.

Universal Minerals, of Los Angeles, Calif., have an unnamed agate—something New! See the ad.

Thompson's Studio, of Pomona, Calif., have some gold nuggets in stock.

Are you interested in Franklin, N. J., minerals? John S. Albanese, of Newark, N. J., specializes in them. Nuff said!

Note: Stardust Gemhouse, formerly of Blythe, Calif., is now located in Phoenix, Ariz.

buy from the man who mines and digs rough gems—is the caption of the ad of Chas. E. Hill, of Phoenix, Ariz.

Gypsum rosettes and other collectors' items are featured by Ward's, of Rochester, N. Y.

Brilliant red vanadinites from the famous Globe, Ariz., locality, are in stock at Burminco, of Monrovia, Calif. You must order a specimen!

Art's Gem Shop, of Gallup, N. Mex., has expert Navajo silversmiths making jewelry to order.

The 9th list of fine minerals from an old collection is released by Hugh A. Ford, of New York City.

Garden State Minerals, of Hoboken, N. J., are eastern headquarters for western agates.

For handwrought Sterling silver jewelry, contact Turquoise Post, of Santa Fe, N. Mex.

More diamond cutting equipment (used) is featured by Herbert Sussbach, of New York City.

Garfield & Audrey Lewis, of Crystal Springs, Ark., are with us again and again they are featuring attractive quartz xls from their state.

All rockhounds will want the new Argon bulb set that has been developed by Ultra-Violet Products, Inc., of Los Angeles, Calif.

Some more crystals are listed by Schortmann's Minerals, of Easthampton, Mass.

Note the nice article on mountaing cabochons by Lucille Sanger, of Chicago, Ill.

A number of interesting roughed-in cabochons are featured by Toupal Brothers, of San Jose, Calif.

Another minerals miscellany is featured this month by Stewart M. Hurlbut, of Salmon, Idaho.

Ernest Meier, of New York City, specializes in fine brilliant cut stones.

A special sale of tiger eye is being held by the Desert Diorama Co., of Tucson, Ariz.

Still another new advertiser is H. L. Chandler, of No. Springfield, Vt., who resides near the famous pyrite locality at Chester, Vt.

And still another new advertiser is Mesa Lapidary, of Costa Mesa, Calif., whose specialty is all phases of lapidary work.

It is a pleasure to announce that a new magazine—devoted entirely to cutting and polishing—will soon be launched on the West Coast. The Editor of this new magazine is Lelande Quick and the Business Manager is Harry R. Ringwald, two good members of the R. & M. A. The new publication is *Lapidary Journal*, of Hollywood, Calif.

A great new book—*Identification and Qualitative Chemical Analysis of Minerals*—has just been released. Its author is O. C. Smith, of Bell, Calif.

The Western Mineral Exchange, of Seattle, Wash., is running a page of super-specials for February.

A. G. Parser, Inc., of New York City, offer this month a long list of rough semi-precious stones. Look it over!

A new advertiser is the Glendale Gem & Lapidary Supply Co. of Glendale, Calif. Their announcement reads that they intend to specialize in only those items in which they can offer the buyer a definite bargain.

Lloyd M. Demrick, of San Francisco, Calif., offers our readers something new but which should have a wide appeal—periscopes, gun sights, and telescopes. They are bargains—note his 2 page ad!

The Sartwell gem drill is a specialty of the Long Beach Mineral & Lapidary Co., of Long Beach, Calif. But they have some nice minerals also.

Old English in fine minerals!—is the caption of the ad of E. Mitchell Gunnell, of Denver, Colo. He has some nice minerals listed.

Don't forget the 6th annual Exhibition and Sale of fine mineral specimens by Schortmann's Minerals, of Easthampton, Mass. The big event will be held in the Lexington Hotel, Lexington Ave., at 48th St., New York City, on Fri. Feb. 28 (9 a.m. to 5 p.m.) and on Sat. March 1 (9 a.m. to 5 p.m.).

Quartz Crystal from Brazil

(Continued from page 117)

used under direction of American engineers.

The quartz crystal deposits of central Minas Gerais were thought to have the best probability of continued productivity, as they are in a populated region with established roads and railroads. Regions like northern Minas Gerais perhaps have greater reserves but they are a little more remote.

Goiaz is the most remote region and one that possibly had the greater reserve. However, difficulties of transportation that make food scarce and expensive in the mining centers and the unhealthful primitive conditions are great handicaps.

Ninety percent of all quartz produced comes from unorganized primitive workings, is sold to a succession of storekeeper dealers in the interior, and from 1 to 6 months later may be exported from Rio de Janeiro or Baia. The only authentic records of the quantity of quartz produced are the quantities exported.

(Minerals Attache Emerson I. Brown, Rio de Janerio.)

BIBLIOGRAPHICAL NOTES

The Iron Ore Bearing Formations of Ohio: By Wilber Stout.

This is largely a compilation of data gathered by many workers over a long period and largely during the active days of the early furnaces when the deposits were well exposed for observation and measurement.

230 pp.,3 tables, Bull.45 (1944).

The Occurrence of Flint in Ohio: By Wilber Stout and R. A. Schoenlaub.

One of the important minerals found in Ohio is flint and some of the chief deposits are the Vanport flint on Flint Ridge in Licking and Muskingum counties, Zaleski flint in Vinton and Jackson counties, and Upper Mercer flint in Hocking, Perry, and Coshocton counties. The flint was first quarried by primitive man and fashioned into arrows, knives, skinners, drills, etc.

The white pioneers, soon after settlement in Ohio, fashioned the rough porous flint into bubrstones to grind their grain in the old water mills. McArthur in Vinton County was noted for such a product. Here the industry was begun about 1807 and continued vigorously for over 30 years. The flint used was the Vanport. At present such material finds little employment except for minor purposes, such as decorating pools, rock gardens, walls, chimmeys, and lately much has been cut and polished by amateur cutters and fashioned into bookends, paper weights, cabochons, etc.

110 pp.,11 pls. Bull 46 (1945)

Both publications issued by the Geological Survey of Ohio, Columbus 10, Ohio.

The Mineral Position of the United States and the Outlook for the Future: By Elmer W. Pehrson.

Our great mineral resources permit 7 percent of the world's population residing in the United States to do 40 percent of the world's work. The fact is that we owe our industrial and military power to our great mineral resources, the equal of which has not yet been developed in any other like area of the world.

This paper is from the Smithsonian Report for 1945, pp.175-200. Issued by the Smithsonian Institution, Washington, D. C.

Gem Hunter's Guide: By Russell P. MacFall (Contributing Editor, Science and Mechanics Magazine), in collaboration with Harry E. Chagnon (Assistant Curator, Dept. of Geology, Chicago Natural History Museum).

A booklet that has been prepared especially for the amateur gem collector is *Gem Hunter's Guide*. It is written in popular style and in a language that should be understood easily by amateurs.

The Guide is divided into 9 parts as follows: It's fun and profitable to hunt gems, p.5; the various gem families, p.7; other silicates valuable as gem materials, p.8: diamonds in the United States, p.9; helps for the gem hunter, p.11; how to identify various gem materials, p.17; gem materials and where to find them, p.31; locations in which gem materials have been found (mineral localities arranged alphabetically by states), p.51; books recommended to gem collectors, p.91. A special 8-page "Portfolio of Gem Materials in their Natural State" is inserted between pages 16 and 17.

This is a very interesting and helpful guidebook for the amoteur collector, whose chief author, Mr. MacFall, is a member of the Rocks and Minerals Association. The Guide is 5¼ x 7½ inches in size, contains 96 pages, sells for $1.00 a copy, and is published by Science and Mechanics Publishing Co., 49 E. Superior St., Chicago 11, Ill.

The Mystic Quarries

(Continued from page 111)

minerals enough you will doubtless think, but the grouping is utterly charming and this unique product of a long continued quarry operation stands today as one of the ornaments of the Havard case of local minerals.

The chief use of the Cambridge Slate here quarried was for foundation stone and the operation ceased with the coming in of concrete. Today the quarries are a melancholy waste of dump heaps.

Common pebbles that are found along the beach of any body of water, when polished often show very pleasing designs and colors. Polish a few of them!

China is the world's largestt producer of antimony and the ore (stibnite) comes chiefly from Hunan and Yunnan provinces.

Garnet is a mineral we commonly think of as occurring in a red color but it is also found in blcak, brown, green, pink, yellow, and white colors—and all in nice crystals.

The Rocks and Minerals Association

(Members All Over the World)

President, Oscar W. Bodelsen
219 E. Main St.
Mt. Kisco, N. Y.

Vice-President, Ronald L. Ives
Univ of Indiana, Bloomington, Ind.

Director of Tours, Richmond E. Myers
Dept. of Geology,
Muhlenberg College, Allentown, Penn.

Secretary-Treasurer, Peter Zodac
Box 29, Peekskill, N. Y.

Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your friends there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

Each new member helps to extend the Association's activities—helps to make your magazine larger, better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of membership: All members in good standing receive:

(1) **Rocks and Minerals**, a monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) The right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationery, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

Mineralogical clubs which subscribe for **Rocks and Minerals** also become affiliated members of the Rocks and Minerals Association and enjoy all the advantages which such an affiliation affords.

A number of clubs hold membership in the Association, participate in the annual outings, and co-operate in many ways in furthering the aims and ambitions of the Association.

Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.

MINERALS

Tellurium with light green encrustation of durdenite, also some pyrite present, Wilcox District, New Mexico
4" x 3" $4.00
1" x 1" $1.00

Descloizite, brown druses partly covered by later generation of transparent calcite, Georgetown, New Mexico
3" x 3" $3.00
2" x 3" $2.00
1 inch fragments $0.25

Chrysocolla, robin's egg blue, Arizona
3" x 3" $3.00
1" $0.50

Sphalerite, triboluminescent, light brown variety in limestone with galena and pyrite, Colorado
1" $1.00

SATISFACTION GUARANTEED OR MONEY WILL BE REFUNDED

Please add postage to above prices

H. H. STEINER

225 EAST 60th STREET **NEW YORK 22, N. Y.**

AUSTRALIAN OPALS

Direct from Australia

BEAUTIFUL BOULDER OPAL SPECIMENS
Thousands now available—Blue, Green, Red, in brown rock. 1" Specimens **25c** and **50c** each.

Larger sizes 2" to 4" or better qualities, **$1.00, $2.00** to **$10.00** each and upwards.

Send $15.00 (minimum order) for nice selection, postage paid.

Also Green and Fire Cutting Opal from **$2.00** per ounce, Rough Faced Black Opals from **$1.00** per carat. Minimum orders, **$10.00.**

Write for our free lists.

NORMAN SEWARD
"Opal House"
457 Bourke Street, Melbourne, Australia
Natural History Books—Thousands—List Free.

HAND-MADE STERLING SILVER JEWELRY

Polished Gem Stones
Wholesale and Retail
Money Back Guarantee

THUNDERBIRD GEM SHOP
P.O. Box 111 **Claypool, Ariz.**

How to Collect Minerals

By Peter Zodac

A complete guide book for the mineral collector, 80 pp., 15 illus. Price $1.00.

ROCKS AND MINERALS
Peekskill, N. Y.

Mention Rocks and Minerals when writing to advertisers